

THE IRON AGE

A Review of the Hardware, Iron and Metal Trades.

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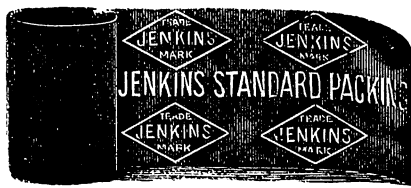
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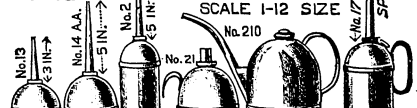
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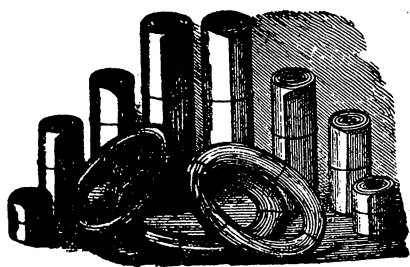
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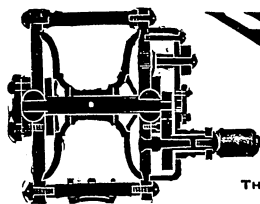
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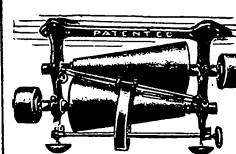
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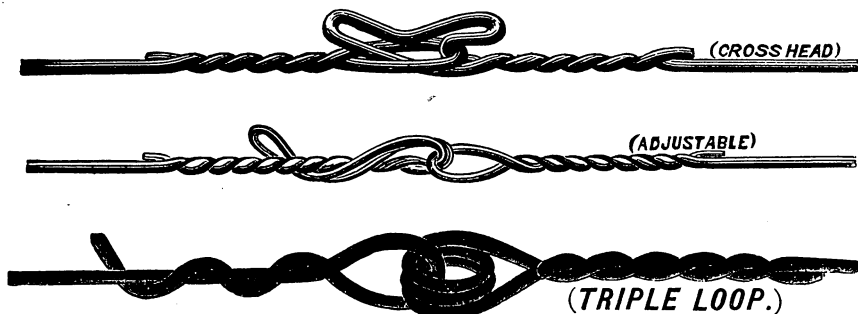
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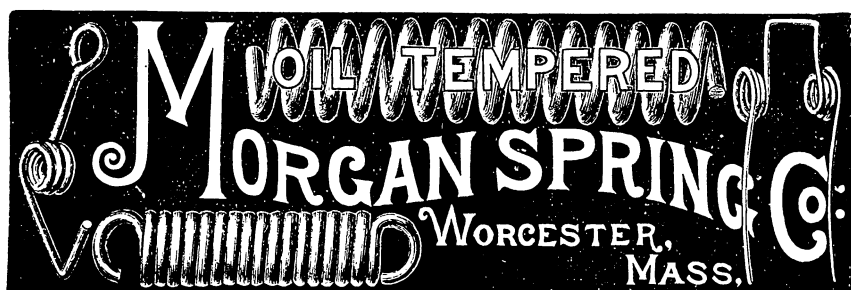
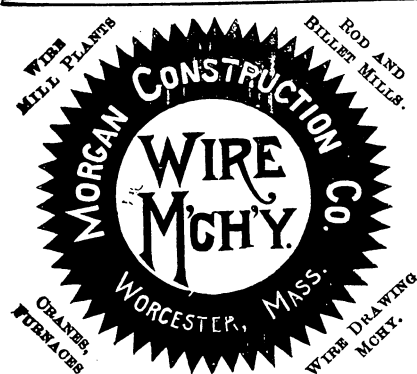


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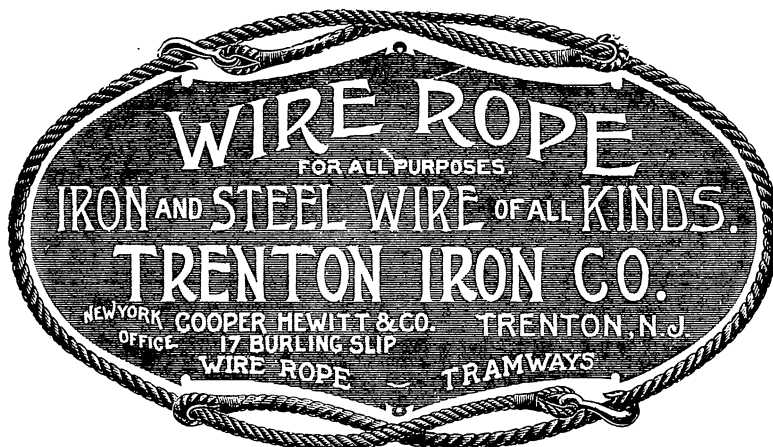
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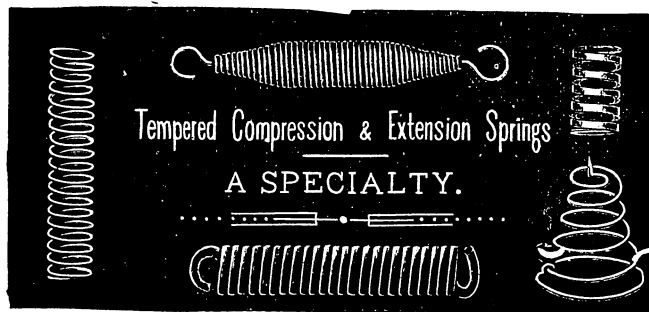
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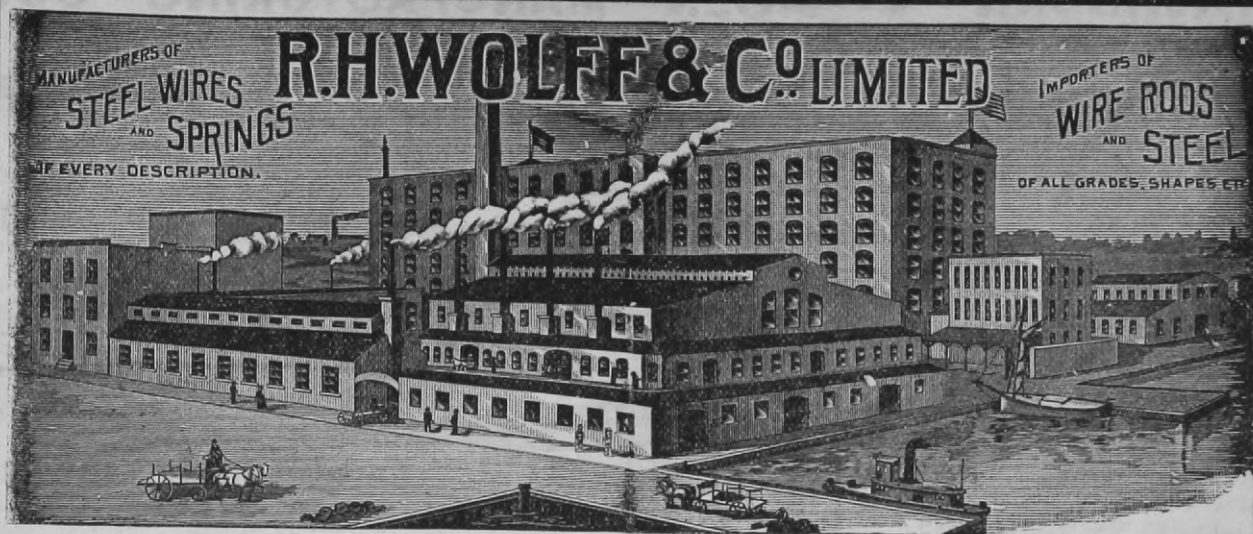
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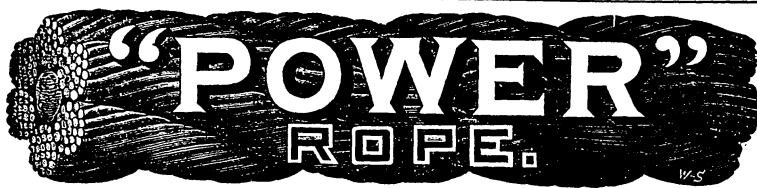
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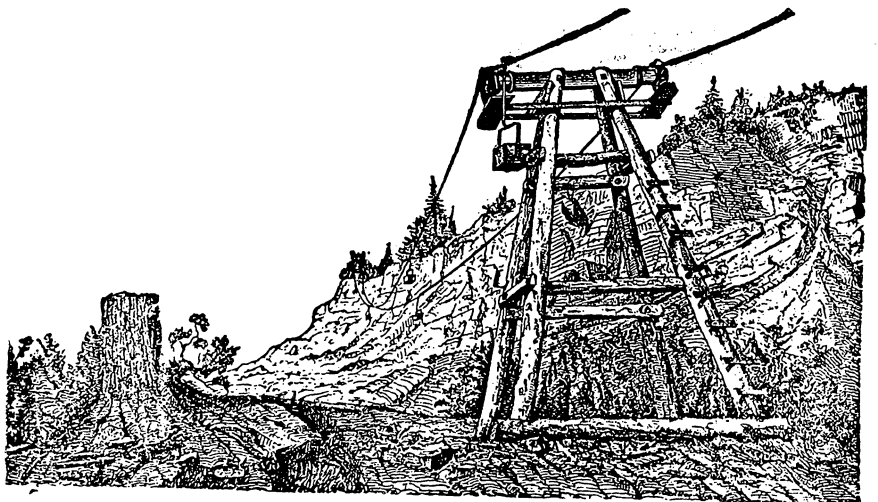
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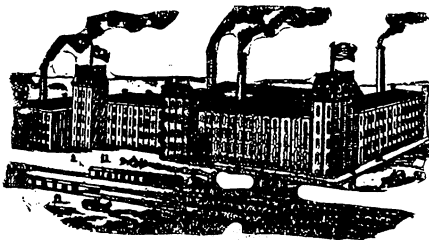
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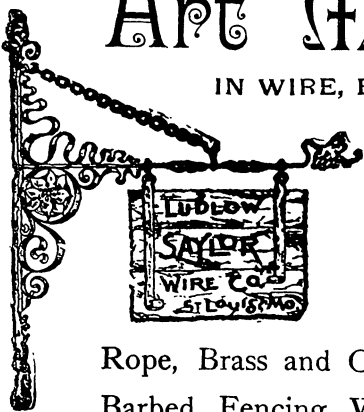
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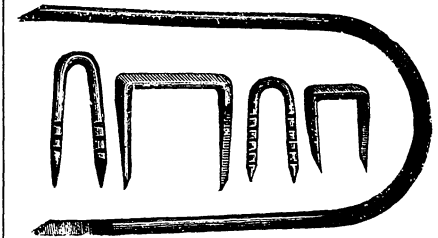
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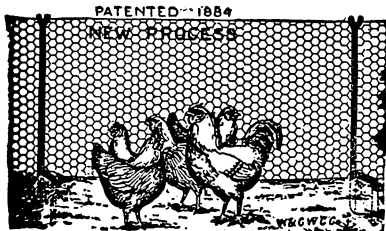
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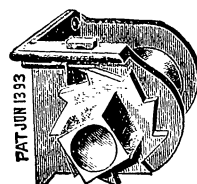
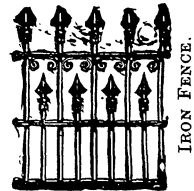
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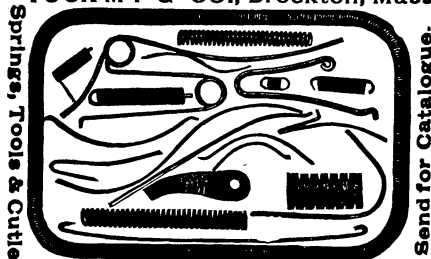
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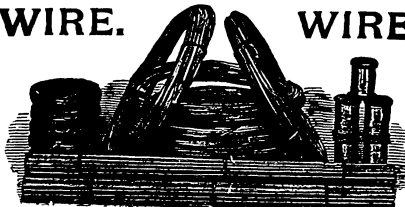
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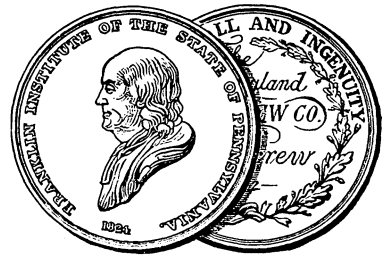
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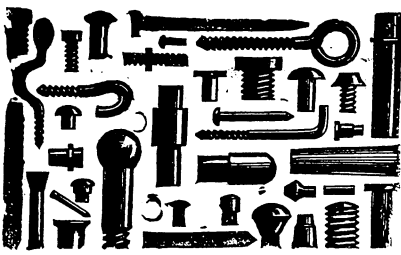
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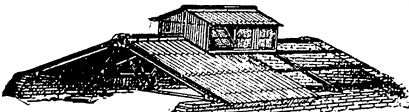
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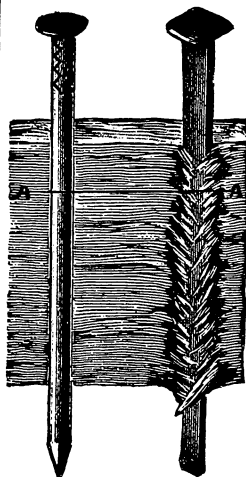
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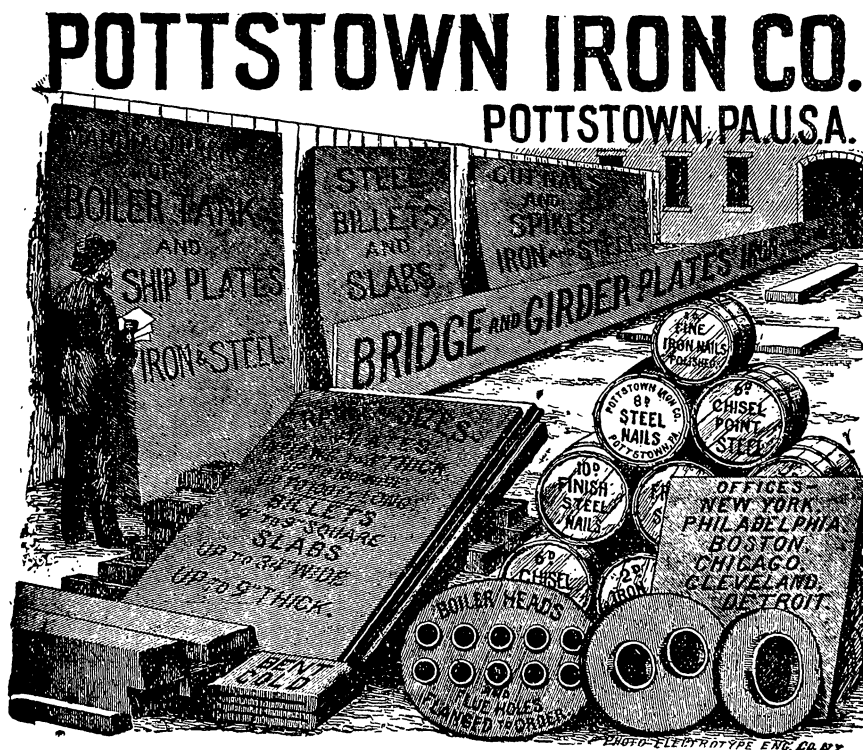
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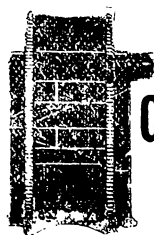
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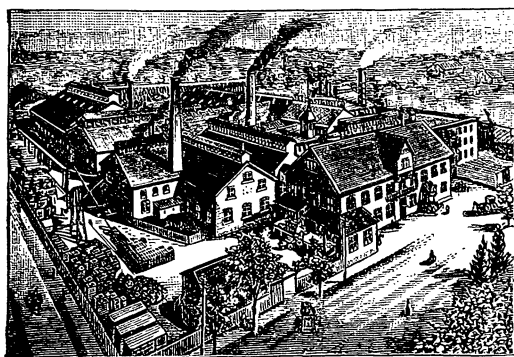
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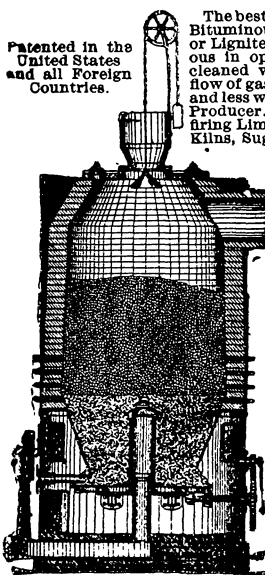
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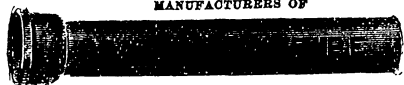
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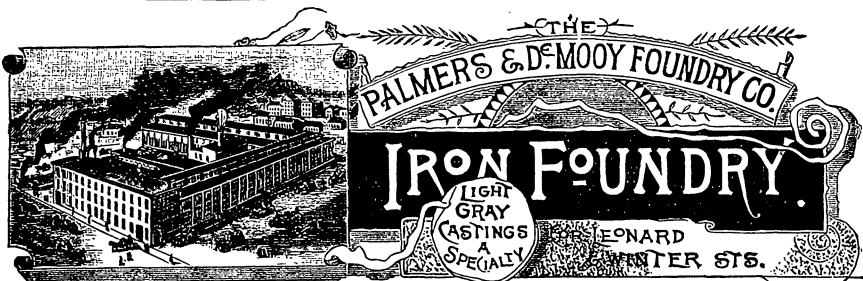
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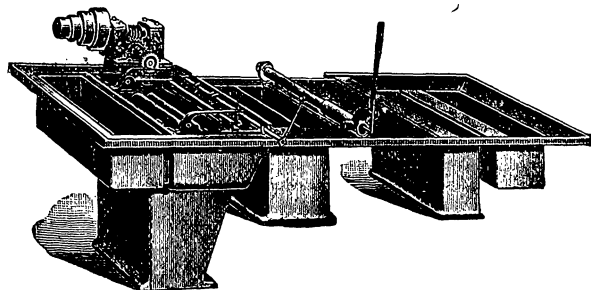
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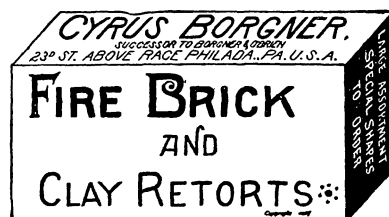
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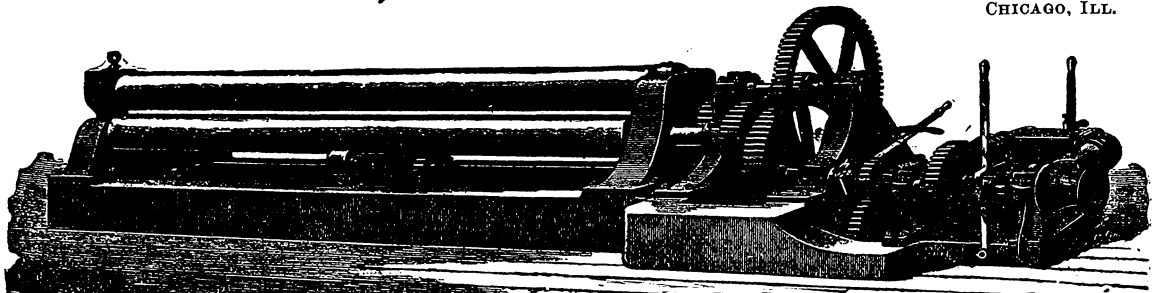
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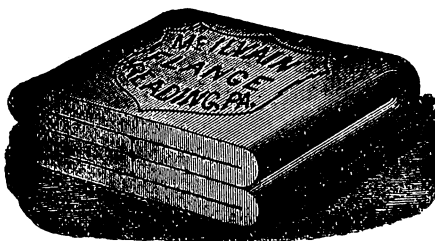
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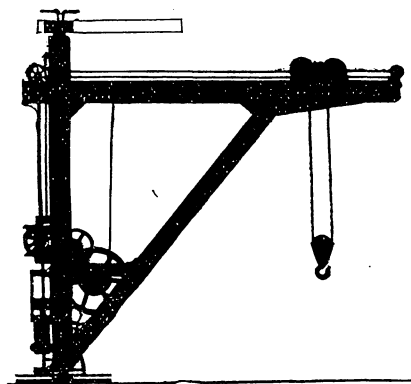
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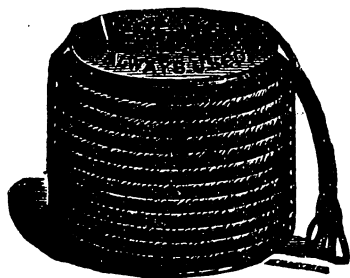
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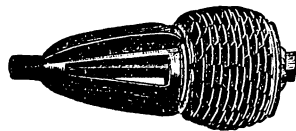


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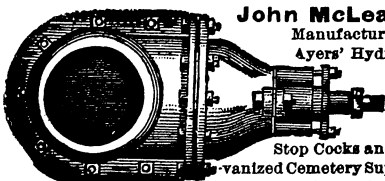
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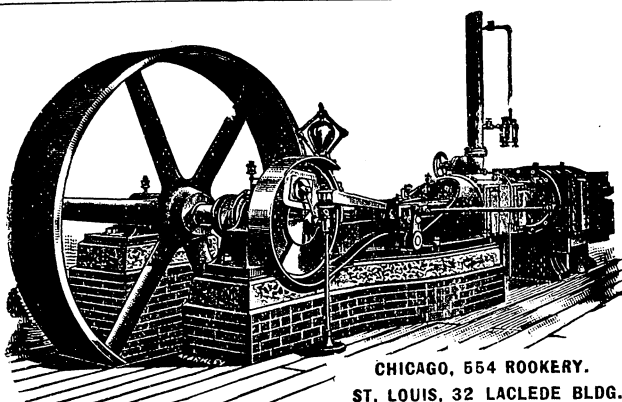
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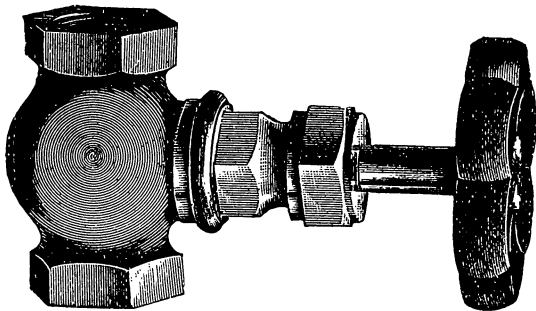
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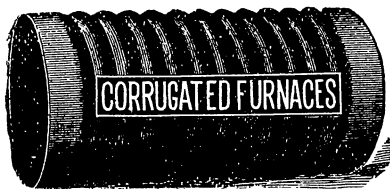
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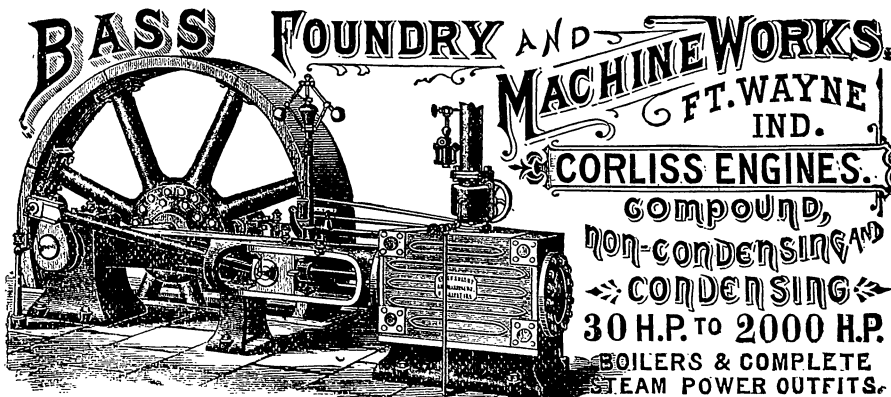
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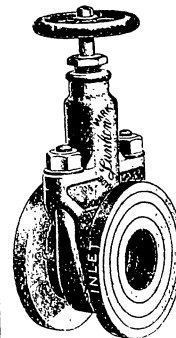
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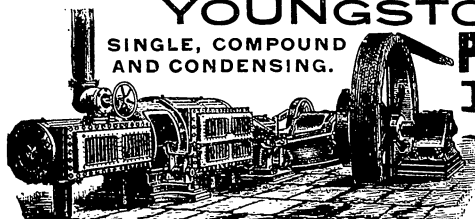
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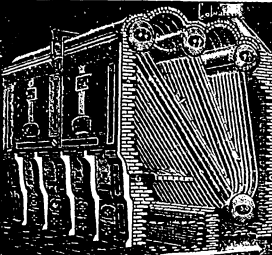
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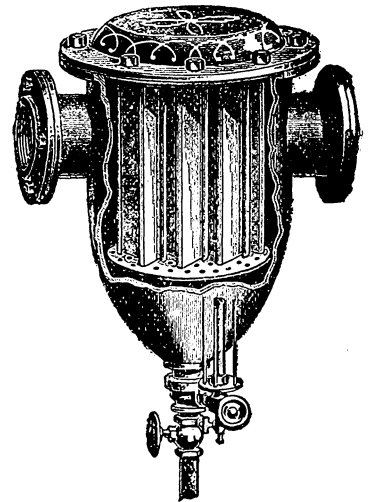
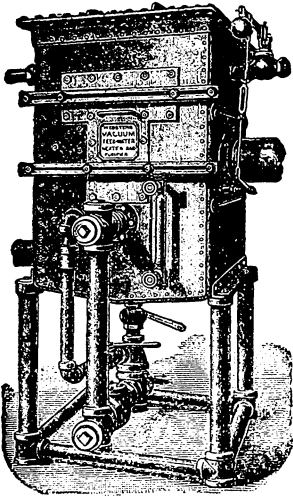
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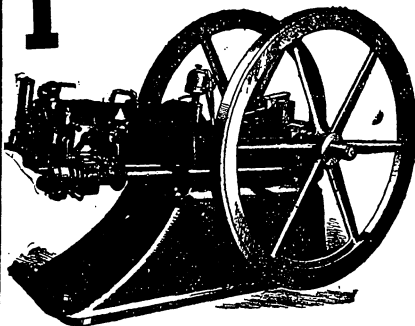
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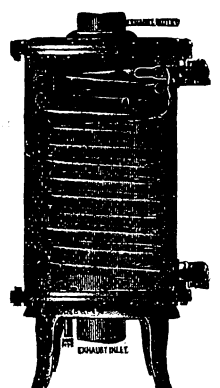
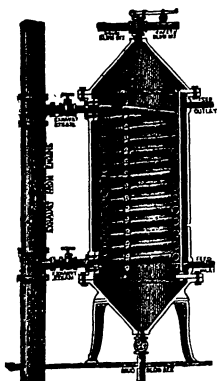
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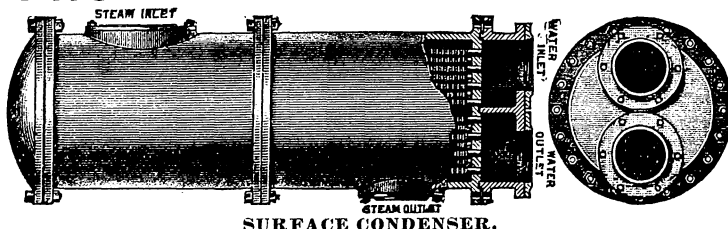
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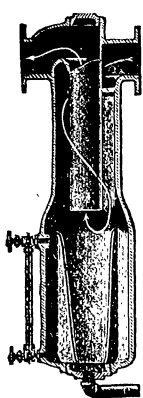
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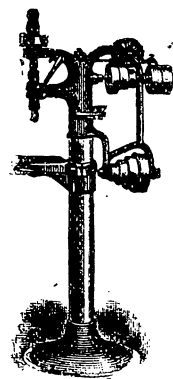
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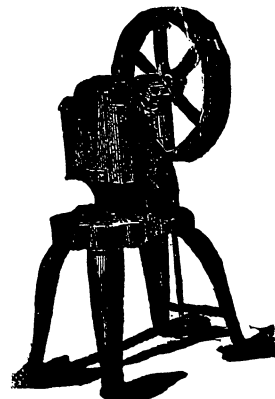
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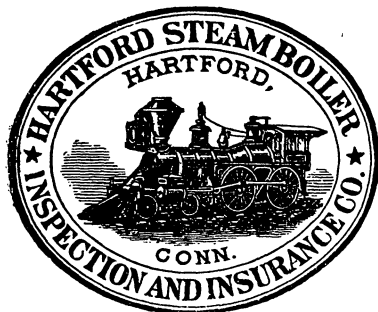
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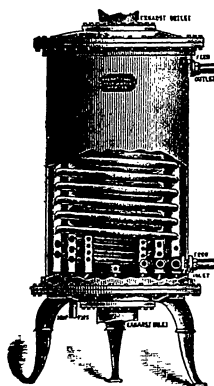
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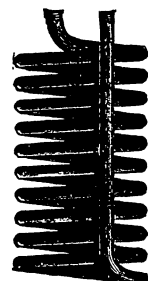


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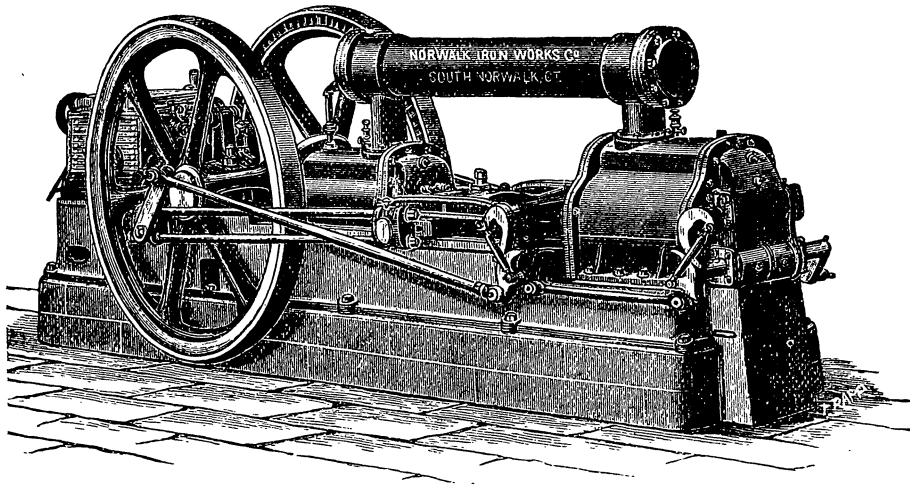
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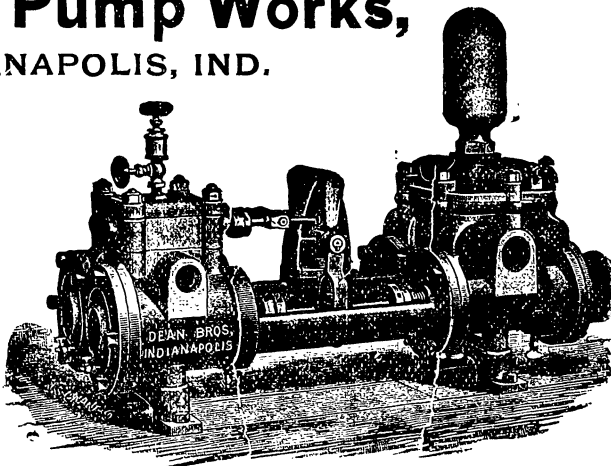
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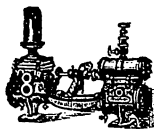
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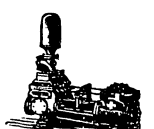
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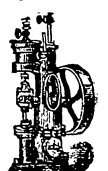
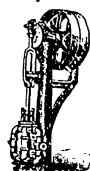
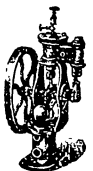
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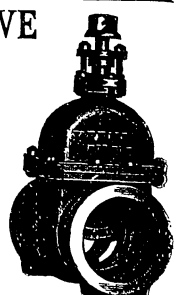
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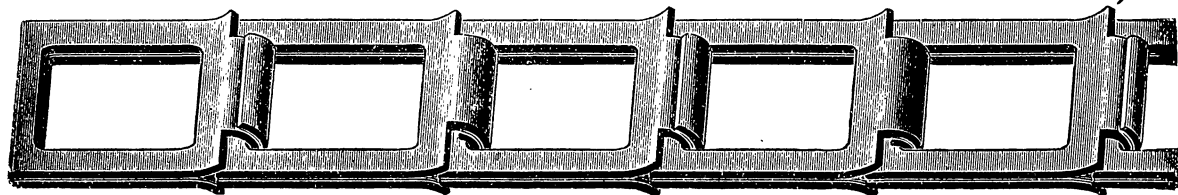
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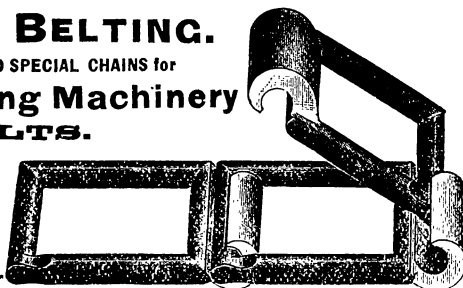
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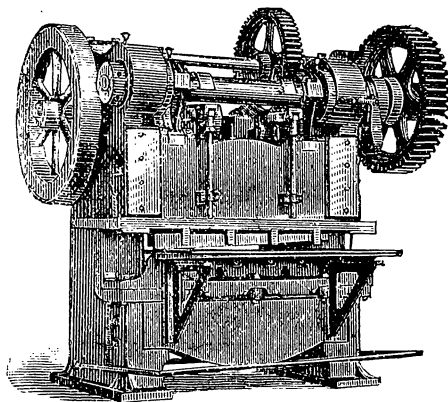
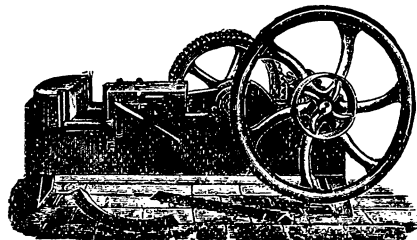
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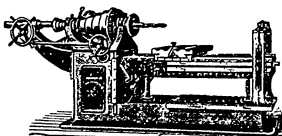
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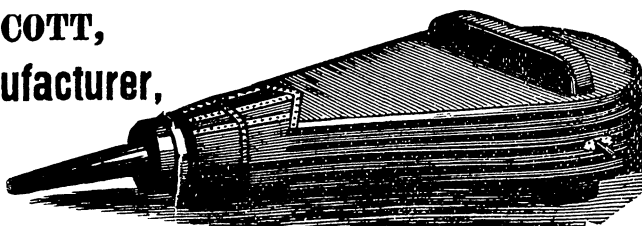
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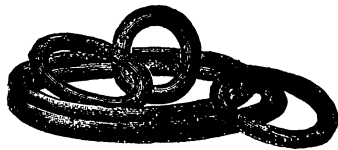
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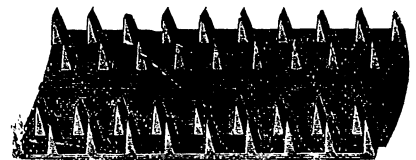
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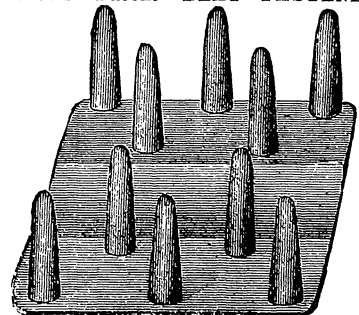
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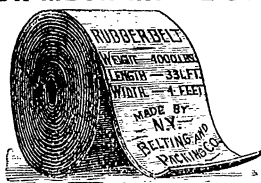
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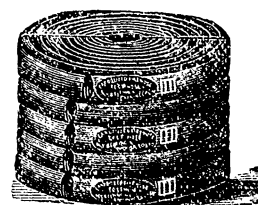
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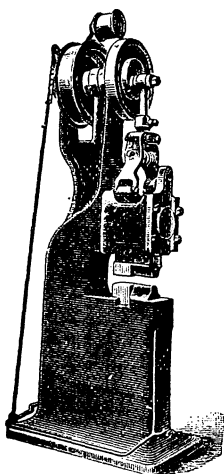
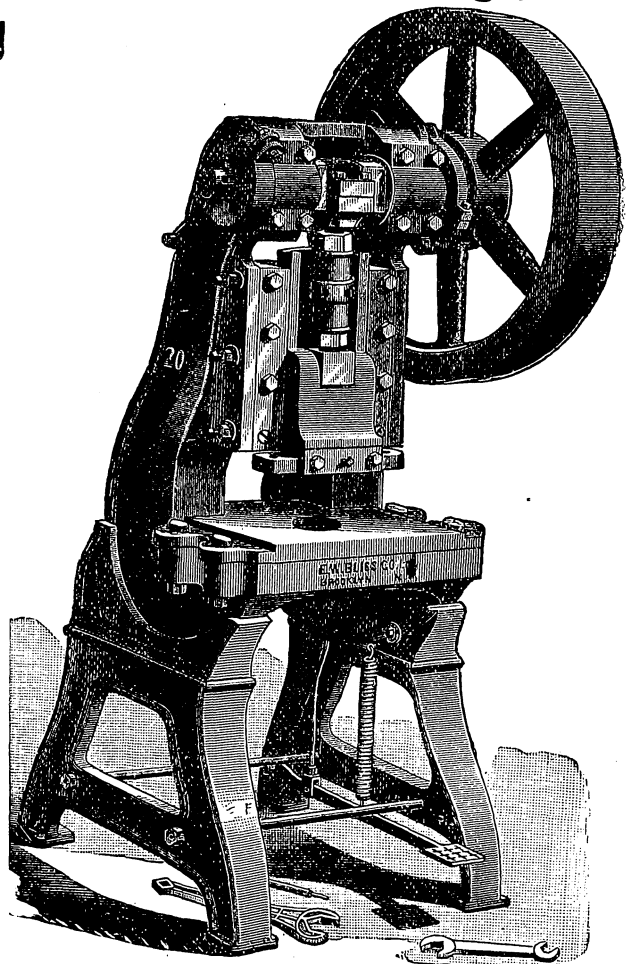
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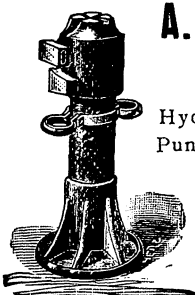
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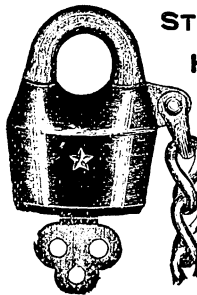
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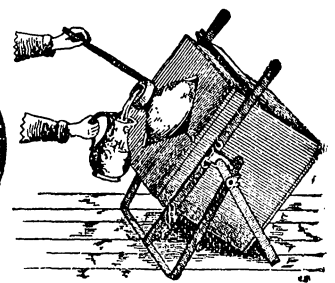
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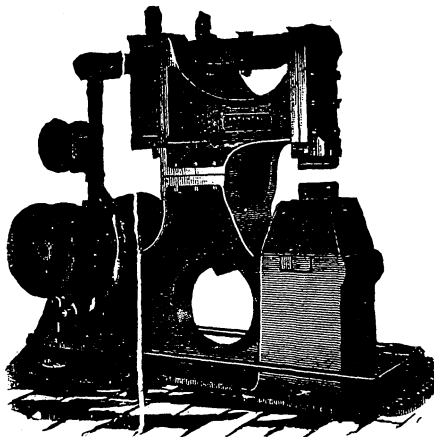
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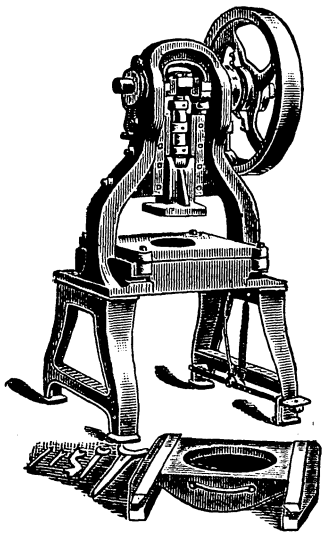
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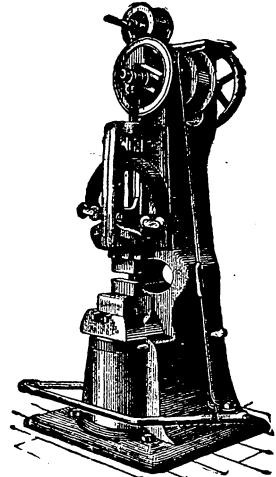


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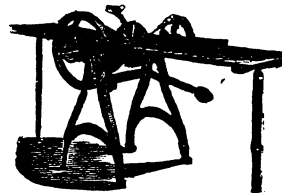
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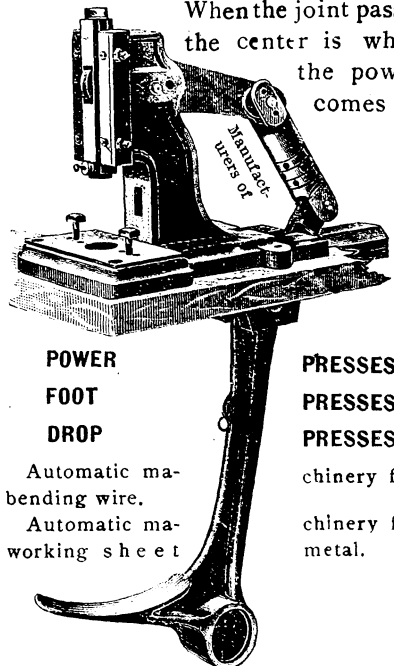
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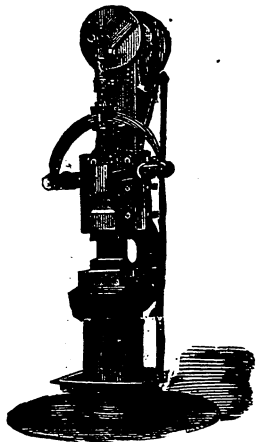
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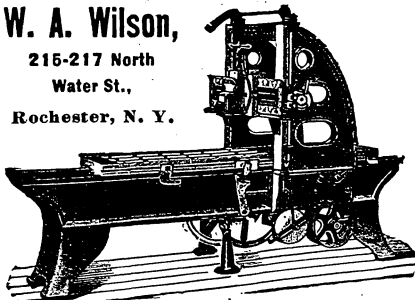
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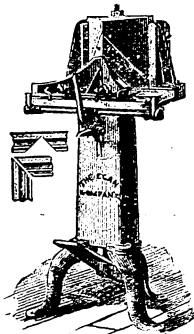
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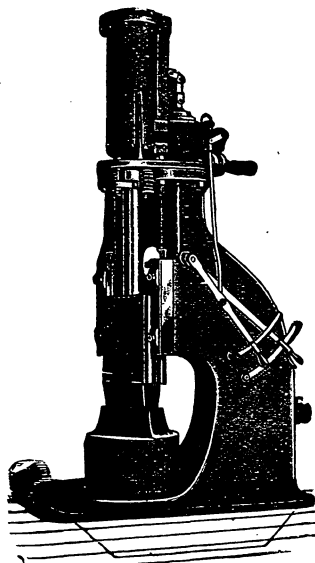
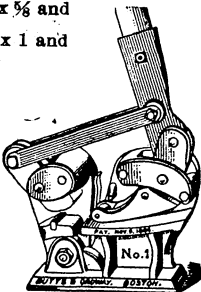
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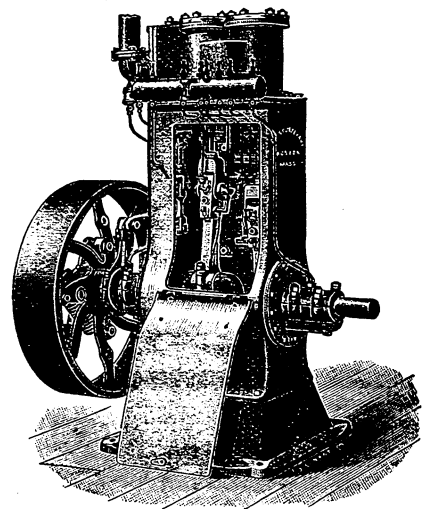
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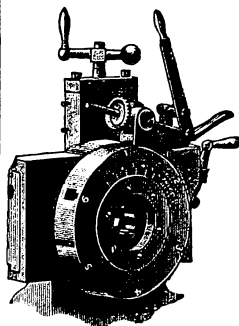
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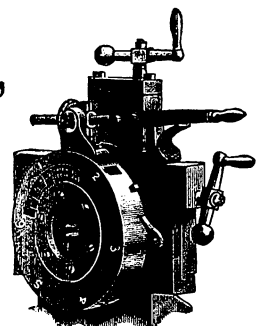
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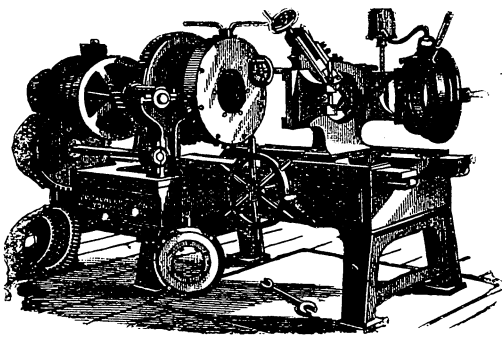
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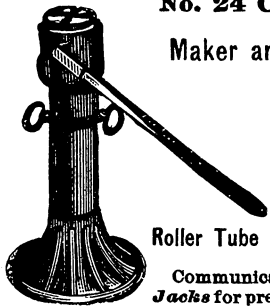
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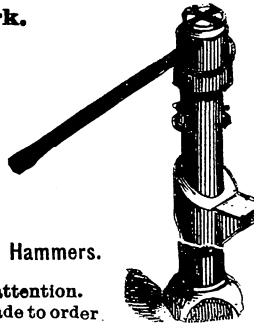
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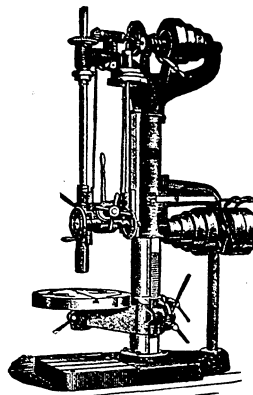
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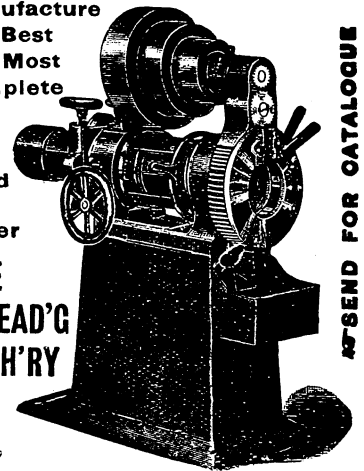
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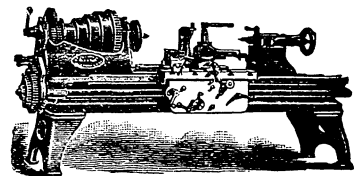
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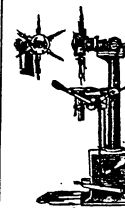
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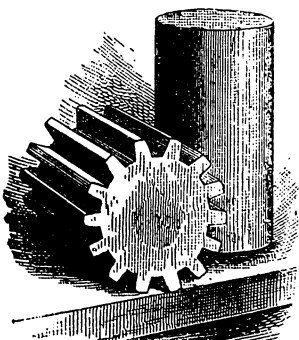
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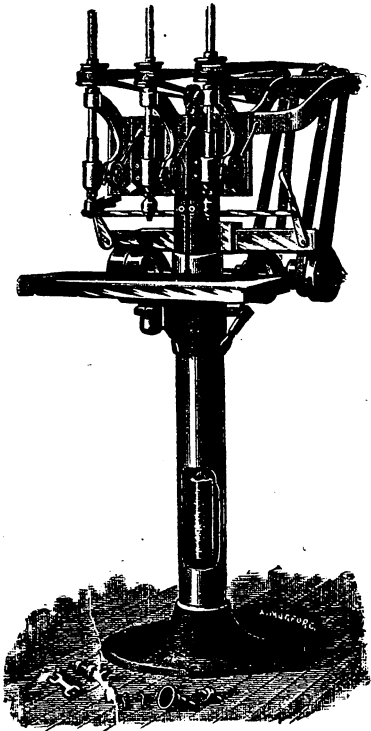


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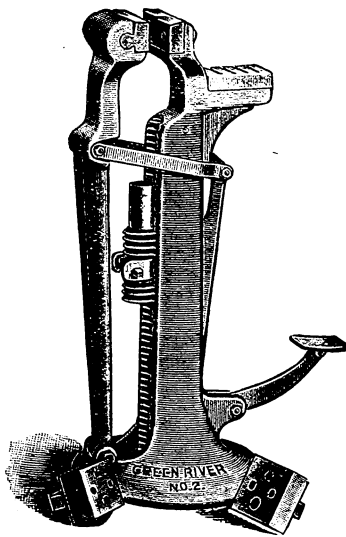
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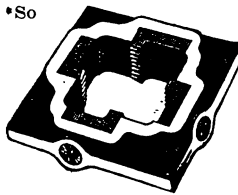
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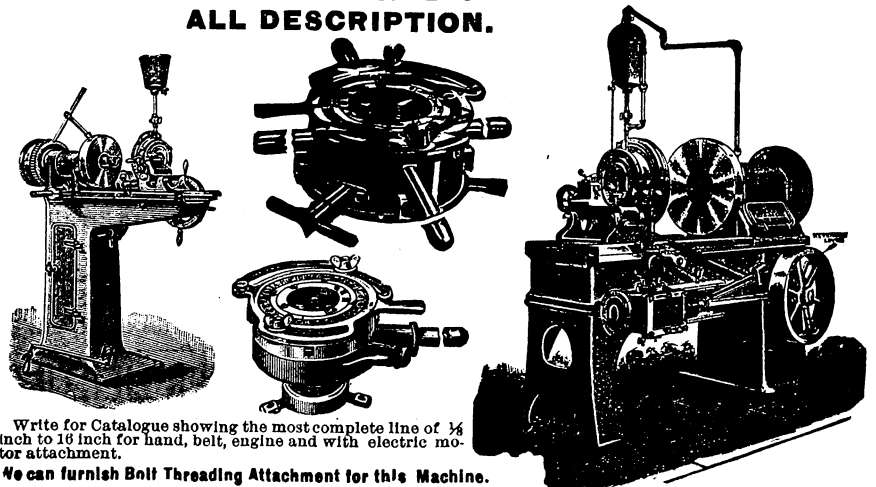
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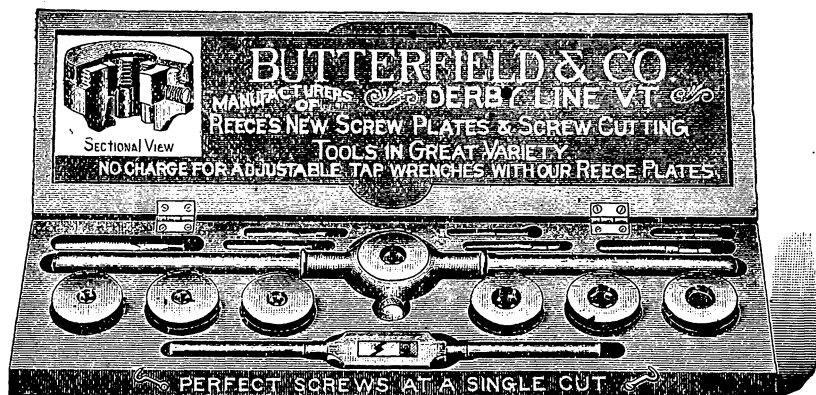
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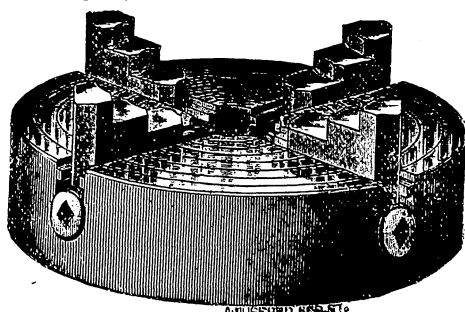
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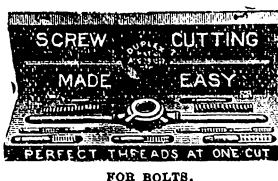


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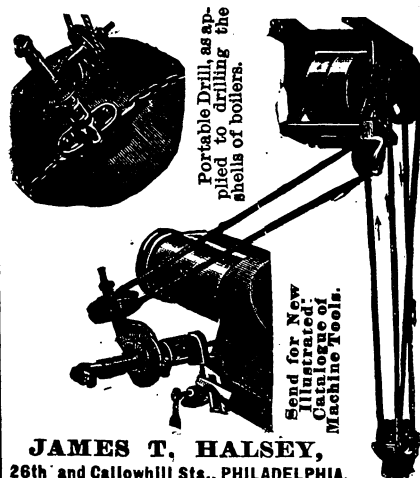
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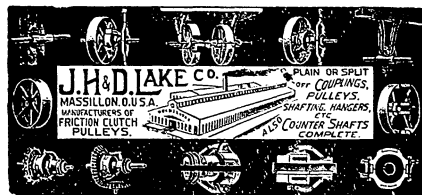
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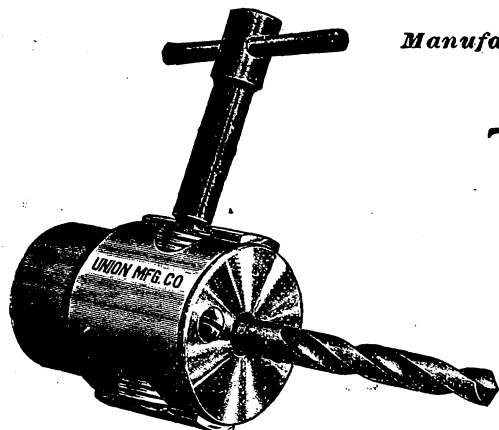
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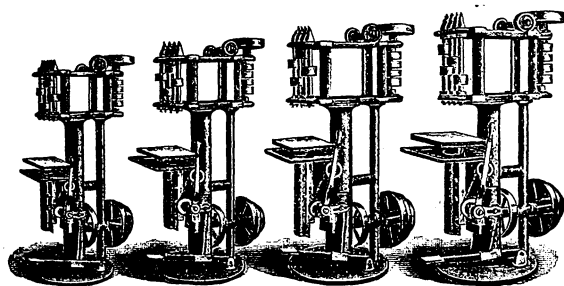
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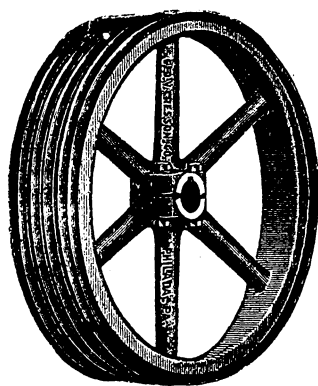
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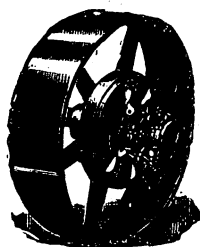
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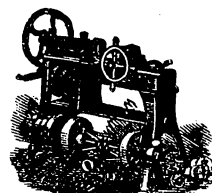


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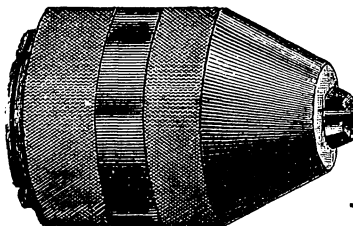
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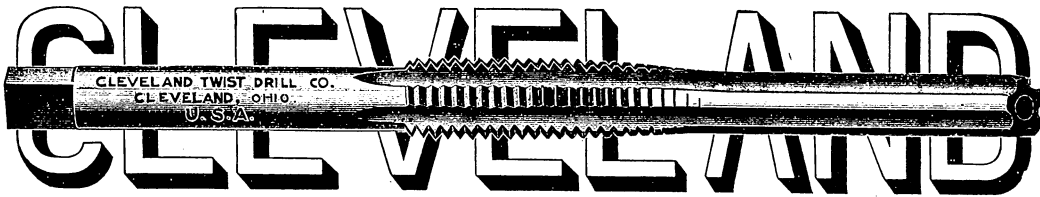
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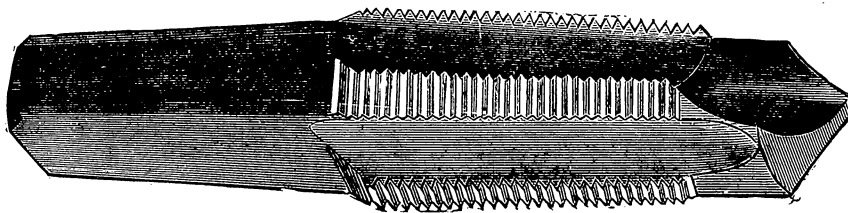
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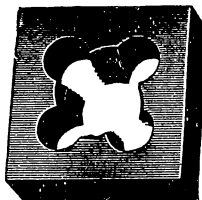
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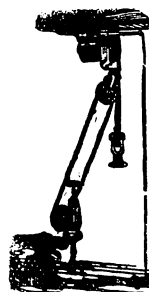
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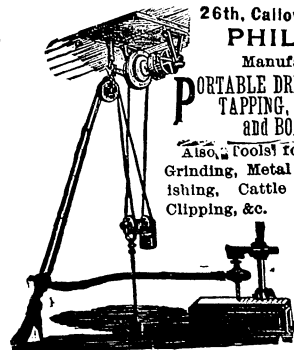
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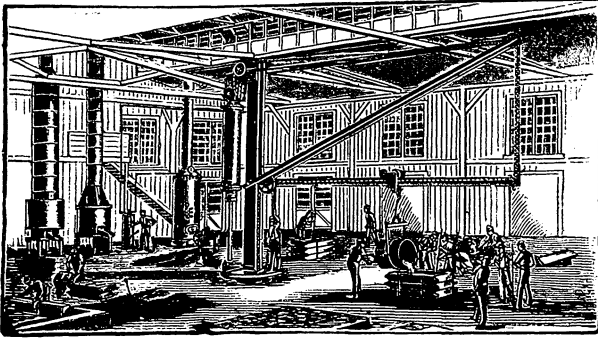
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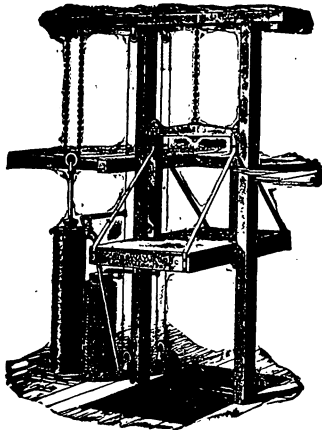
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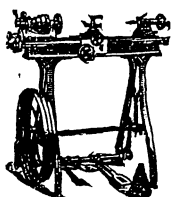
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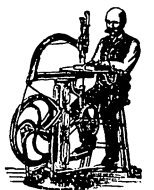
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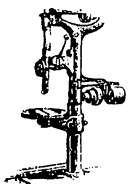
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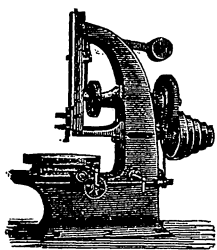
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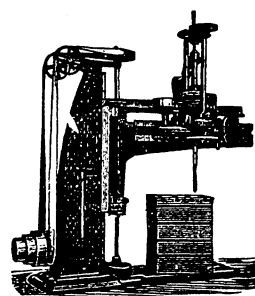


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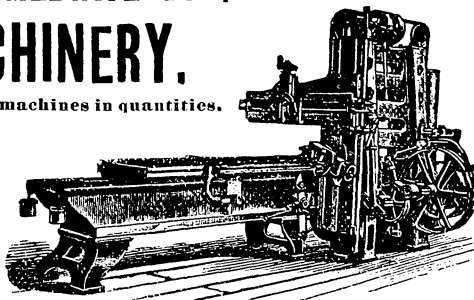
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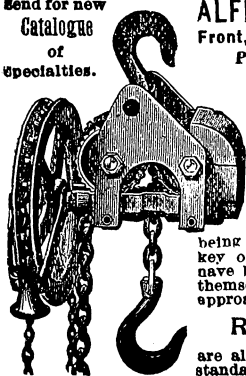
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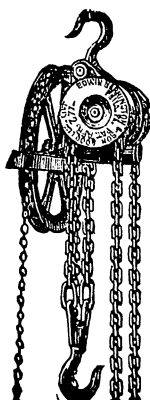
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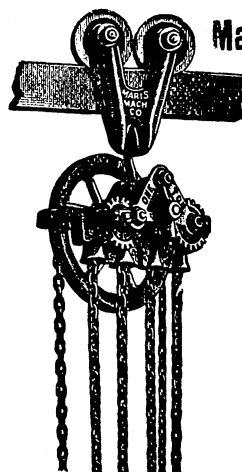
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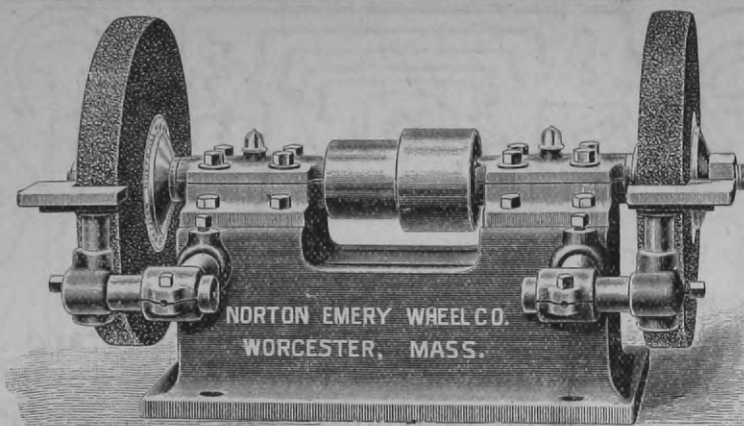
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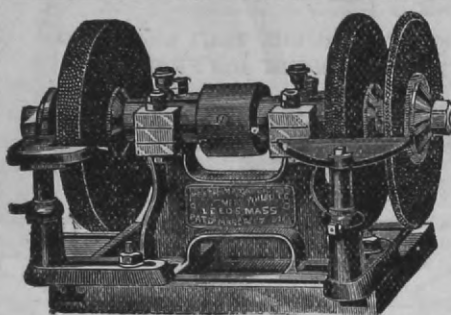
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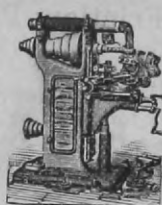
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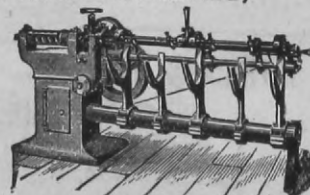
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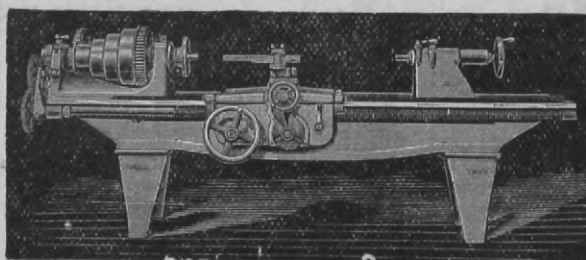
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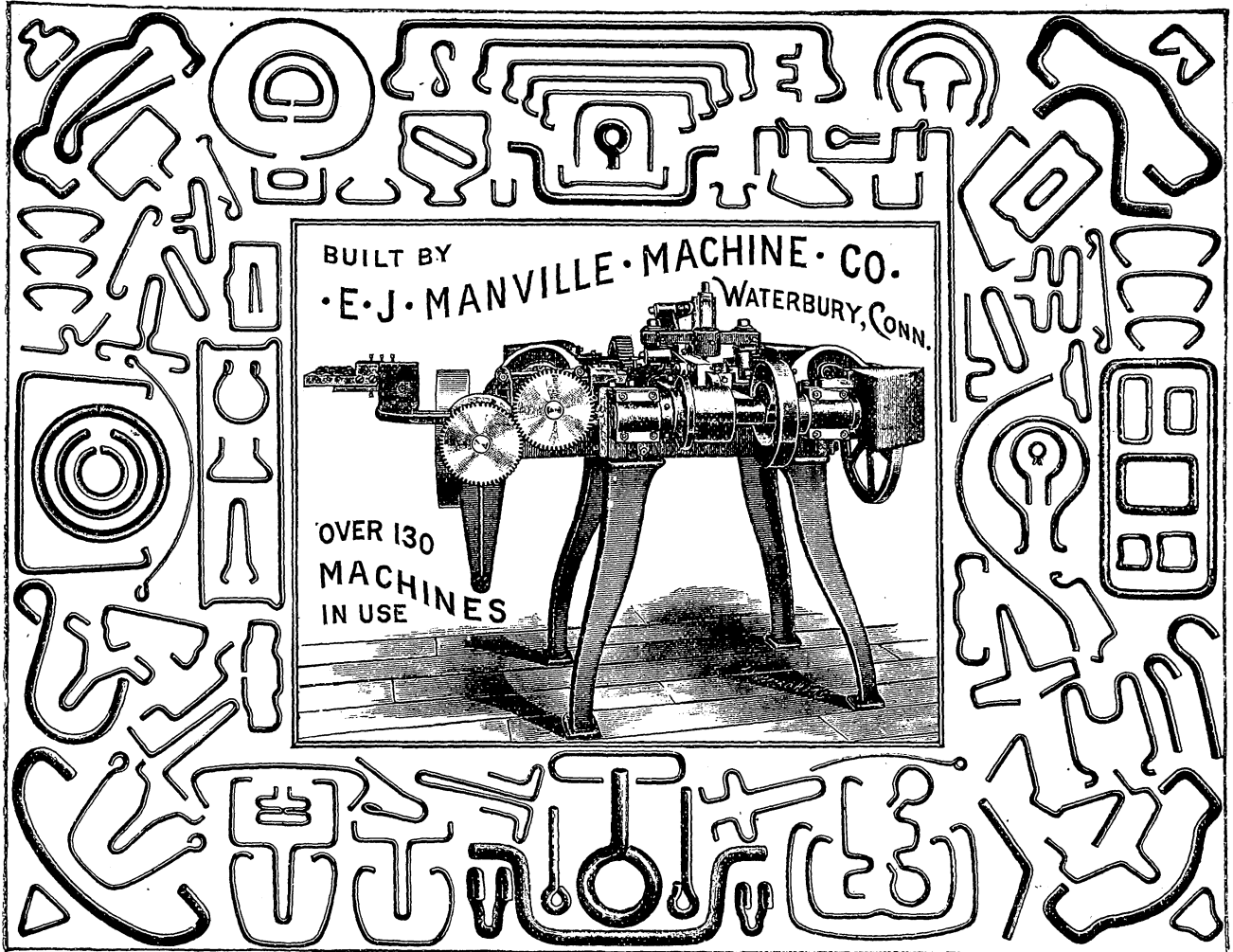
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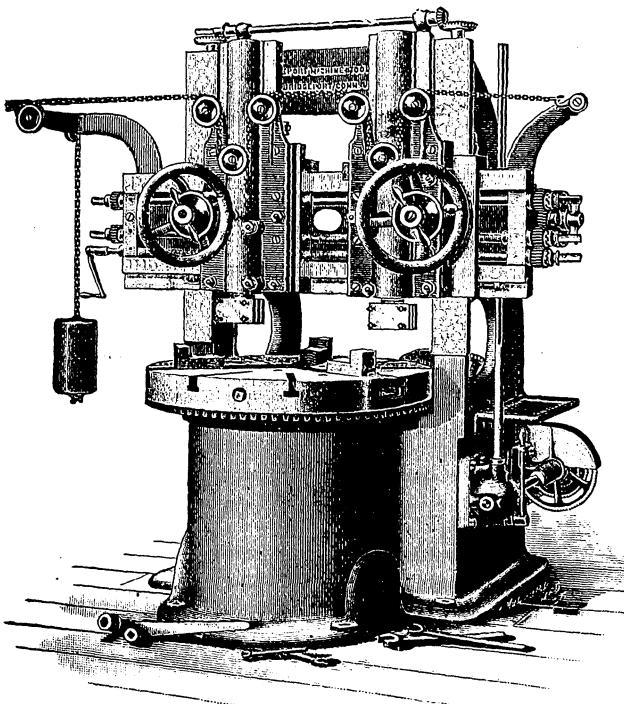
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1 Corliss Engine, nearly new; 250 H. P.
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93 in. Hydraulic Riveter, Jones & Lamson.
Pump, Accumulator, 100 in. Swing Engine
Traveling Crane, 16 1/2 ft. Lathe, 20 ft. Bed.
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72 in. x 60 in. x 24 ft. 4 Gang Drills, Mill'g Mch.
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Switch Planer, 2 Heads, Blake Duplex Compound
Good as new. Pumps, &c.

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TWO OF THEM; SECOND HAND.

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Height, 8 ft. 2 in.

Greatest Distance Spindle to Base Plate, 52 in.
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Back Geared and Power Feed, Quick Return, Balanced Spindle; Shafts and Studs made of Steel.

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A full line of the most improved Turret Lathes, and Pulley Machinery, also Motor Gear Cylinder Boring and Triple Facing Machines.

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2 Double Deck Boilers about 40 H.-P. each, cheap. Hoisting Engine. Cylinder Boilers for Stacks, 30, 36 and 42 in. diameter. Round and Square Iron Tanks. Blow Offs. 6 Brass Cannons about 1400 or 1500 pounds each. Good order. All kinds of Scrap Iron and Metals on hand.

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24 x 48 Miller & Allen Corliss Engine.
 16 x 36 Slide Valve Engine.
 16 x 24 " " " " New.
 15 x 30 " " " " "
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One Fifield Screw Cutting Engine Lathe, 30 in. swing on 16 ft. bed, with blocks to raise same to swing 47 in.

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 1 18 in. x 6 ft. Lodge & D.
 1 18 in. x 6 ft. Perkins.
 2 18 in. x 8 ft. Wm. Munzer.
 1 20 in. x 6 ft. E. P. Bullard.
 1 20 in. x 10 ft. Putnam.
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1 16 in. Lathe & Morse.
 Crank.
 1 20 in. x 20 in. x 6 ft.
 Pratt & Whitney.
 1 22 in. x 22 in. x 4 ft.
 Pond.
 1 24 in. x 24 in. x 5 ft.
 New Haven.
 1 28 in. x 28 in. x 7 ft.
 New Haven.
 1 40 in. x 40 in. x 9 ft.
 Pond M. T. Co.

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2 10 in. 3-Spindle Slate.
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 1 Pratt & W., 3-Spindle.
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1 Newbold Rotary Shear, cuts 1/4 in. thick.
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 1 No. 3 Styles & Parker Punch.
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 Send for details and prices.

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9 ft. x 11 ft. Scotch Boiler, 110 lbs. Steam.
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 Knowles Independent Condenser for 350 H.-P. 250 H.-P.
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Three 100 H.-P. Armington, & Sims Automatic Engines.

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One 87 " Beck " "

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In lots to suit, and ready for delivery.

8000 tons 60 lb. Steel T Rails.
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All selected and in excellent condition for relaying and only slightly worn.
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Corliss.	High Speed Auto.	Horizontal Slide Valve.	Vertical Slide Valve.
10 x 20	11 x 20	8 x 24	20 x 24
10 x 24	10 x 14	10 x 12	13 x 16
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Heavy Plate and Bar Shears, Engines, Boilers, Pumps, Cranes, Fairbanks Testing Machine, &c., &c., for sale by
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All second-hand and very cheap.

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30 in. x 30 in. x 10 ft., A1 Order.

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ENGINES, Horizontal and Vertical. All types and sizes up to 2000 H.-P.

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Lathes, 52 in. swing by 41 ft., 54 in. swing by 22 ft., 30 in. swing by 22 ft. One Pitt Lathe.
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 Engines, 5 new and 7 second-hand, from 100 H.P. down.

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A Dinky capable of hauling 40,000 lbs., for a small ore road; width of gauge, 36 inches. Please give the lowest cash price. Address
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15 in. x 7 ft. Sebastian Lathe.
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Solid Grindstone Frames, Emery Grinders, &c., &c.,

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A Porter Hamilton Slide Valve Steam Engine, 30 x 36, with wheel 12 ft. x 50 in. Rubber Belt, 11 ply, 110 ft. long 48 in. wide. Engine good as new. Built by William Tod & Co., Youngstown, O. Can be seen near Pittsburgh, Pa. For further particulars apply to

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200 hundred tons of 35 lb. Iron Relaying Rails with splices, also some 20 lb. Steel rails.

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Second-hand Engine Lathe, if in good condition, 48 to 50 in. swing, short bed. Send full description, with price.

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Very Desirable Second Loft
No 99 CHAMBERS STREET,
CORNER OF CHURCH, 25 X 100 FEET,

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One Buckeye Girder Frame Automatic Cut-off Engine, Cylinder 14 x 24 inches, 120 H.-P., in good order, having been but little used. P. O. BOX, No. 182, Baltimore, Md.

FOR SALE. CRANE.

About fifty feet high, for lifting heavy weights and breaking heavy cast iron. Can be re-erected in open lot. For further particulars address

DAN'L W. RICHARDS & CO.,
88 to 96 Mangin St., New York.

A RARE CHANCE

to secure an established Machine Tool business in New England, with a good supply of orders, is offered by the advertiser, who must give preference to other interests. Tools, stock, etc., will be sold at a bargain.

Address
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office of *The Iron Age*, 146 Franklin Street,
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WANTED.

A No. 3, 4 or 5 Gates Rock Breaker. State condition and price. Address

"BREAKER,"
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The Advertiser

desires to sell half interest in an established, paying Hardware business in a progressive Southern city to an energetic, live man, together with half interest in his storehouse, four stories and basement, requiring an investment of from \$10,000 to \$20,000. If interested, address
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Stock and fixtures of an old Hardware and Tool store, in New York City, established over 75 years. Has customers on both continents. Merchandise and fixtures are clean and new. This is an opportunity for persons wanting an opening to make money. Incorporated. Only reason for selling is to close an estate. Address, appointing interview, "OLD BUSINESS," office of *The Iron Age*, 96-102 Reade St., N. Y.

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A complete plant, consisting of Presses, Lathes, Dies, Boiler, Engine, &c., suitable for spinning, stamping and drawing sheet metal goods. Price \$8000, which is one-quarter of its value. Option of lease on four-story building.

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At Orangeburgh, New York, 21 miles from New York City, on the West Shore and Erie Railroads, with switch from each road. Two new one-story brick buildings, 75 ft. x 130 ft., built on the most approved modern plans. Will be let, with electric power, either singly or together. This location is unsurpassed for manufacturing purposes. For further information apply to
T. T. P. LUQUEK, Agt.,
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FOR SALE.—Stock Hardware, Farm Tools, good will and store fittings of wholesale and retail business of long standing downtown in New York. Must sell on account of other business interests. Address "HARDWARE," P. O. Box 680, New York.

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ATTENTION! Merchants and Manufacturers.—We collect your past due accounts. Do not let them remain too long upon your books. Send for our draft book.

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Successors to
HAYDOCK & BISSELL,
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HARDWARE AUCTIONEERS,

12 Murray St. and 15 Park Place, N. Y.
Sales held weekly for the trade. Consignments solicited. We refer to the leading manufacturers and importers.

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You remember the old saying, and why don't you prepare for the business revival? We want to figure on the new parts to repair your machines with, and should like to work out a design for an improved machine. In fact, we want machine-shop work of any kind, and the way we plan to get it is to do the best work at the most reasonable figure.

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Chicago, 902 Masonic Temple; Philadelphia, 119 S. Fourth Street; Cincinnati, 34 West Third Street; Boston, 19 Milk Street; New York, 278 & 280 Broadway; Pittsburgh, 121 Third Avenue.

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Cincinnati, O.

HELP WANTED.

Undisplayed Advertisements for Help Wanted not exceeding fifty words One Dollar each insertion. Additional words two cents each.

SALESMEN WANTED; one of the largest and oldest manufacturing companies in fancy and upholstery hardware has an opening for good salesmen having trade in this line, one in Philadelphia and vicinity and one in Boston and vicinity. Address, stating who you have traveled for, reference and salary and commission expected, "PRESIDENT," P. O. Box 1042, New York City.

TRAVELING SALESMEN visiting stove and tinware, hardware, house-furnishing or plumbing and gas fitting trade, either retail or jobbing, will learn of something of interest by addressing "B. J. W. & Co.," Lock Box 47, Mercer, Pa.

A THOROUGHLY RELIABLE, strictly honest, energetic young man of unquestionable character, with good business address, ultimately for traveling salesman; must possess some knowledge of mechanics; business tact and untiring energy necessary to fill position; state references, experience, age salary expected at beginning, &c. "IRON MANUFACTURER," office of *The Iron Age*, 96-102 Reade street, New York.

A YOUNG MARRIED MAN, 25 to 30 years old, who has had experience in bookkeeping and buying in a large cornice and tin jobbing works, or has experience in a wholesale and retail tinners' supply house; must be a good penman, quick and accurate at figures; state all places where formerly employed, how long in each place, cause of leaving and duties performed; best of references and bond required; state salary expected; answer above questions fully or no communications will be considered. Address "BOOKKEEPER & BUYER," office of *The Iron Age*, Bank of Commerce Building, St Louis, Mo.

HARDWARE SALESMEN wanted, to take a Wire Stretcher as a side line; liberal commission; these goods are now in season. F. J. TOWNSEND, Painted Post, N. Y.

FOREMAN for steel foundry; must be practically familiar with molding, melting and all details of foundry, and capable of taking full charge of work in absence of proprietor. Address, stating age, experience and salary expected, "STEEL FOUNDRY," office of *The Iron Age*, 96-102 Reade St., New York.

WE ARE DESIROUS of establishing agencies throughout the Union, with manufacturers or dealers in electrical or mill supplies, manufacturers or dealers in power boilers or machinery for the sale of our incomparable boiler compound. THE VEGETABLE BOILER COMPOUND CO., Utica New York.

SALESMEN in Arkansas, Miss., Ala., Georgia, S. Carolina and Florida to sell staple line of hardware on commission. Address "EDWARDS," care E. S. ADAMS, office of *The Iron Age*, 312 The Cuyahoga, Cleveland, O.

SITUATIONS WANTED.

Undisplayed Advertisements for Situations Wanted not exceeding fifty words Fifty Cents each insertion. Additional words one cent each.

A THOROUGH Mechanical Engineer desires a position in a good company, with a view of eventually securing an interest in same; has a thorough technical and business education and 12 years' practical experience, designing, superintending, estimating, constructing and buying rolling mill, blast furnace, machine tool and light and heavy general machinery. Address "GOOD COMPANY," office of *The Iron Age*, 96 102 Reade street, New York.

A YOUNG MAN of ten years' experience in the export business in New York City, and with an extensive acquaintance among exporters, desires to negotiate with manufacturing concern with a view to making arrangements to act as representative for the introduction of their goods in foreign countries. Address "FOREIGN," No. 33, office of *The Iron Age*, 96-102 Reade St., New York

A RESIDENT of Philadelphia, Pa., having extensive acquaintance among merchants and manufacturers and possessing business ability of exceptional character, desires to correspond with house outside Philadelphia with a view of establishing an agency in Philadelphia. Address "J. H. B.," office of *The Iron Age*, 220 South 4th St., Philadelphia, Pa.

BY A MAN having had five years' experience as New York City agent for a company selling the jobbing hardware and house-furnishing trade, prior to that had ten years' experience in same trade in Maine, New Hampshire, Vermont and Eastern Massachusetts; a permanent position wanted, or might travel on commission. Address "W. J.," No. 215, office of *The Iron Age*, 96 102 Reade St., New York.

BUSINESS MAN of ability, character and responsibility desires office occupation; large experience as manager and executive; salary less an object than a field for usefulness, with a view of finally acquiring an interest in the business. Address "EXECUTIVE," office of *The Iron Age*, 96-102 Reade St., New York.

FOUNDRIY FOREMAN, capable of handling men and getting out work at lowest cost, is open to engagement; is practical and will work for firm's best interests; will be glad to correspond with anyone in need of such a man; best of references given. Address "LOWEST COST," office of *The Iron Age*, 96-102 Reade St., New York.

BY A SOBER, STEADY MAN, a position in the manufacture of solder and Babbitt metals; have had several years' experience and can furnish the best of reference. Address "SOLDER," office of *The Iron Age*, 220 South 4th St., Philadelphia, Pa.

BY A PRACTICAL PATTERN MAKER; best of references. C. H. LEWIS, 10½ Chatham St., Utica, N. Y.

BY A FOUNDRIY FOREMAN; is a practical molder and experienced foreman; best of references. Address "PRACTICAL," No. 33, office of *The Iron Age*, 96-102 Reade St., N. Y.

BY A TRAVELING SALESMAN thoroughly experienced in full line of general and builders' hardware, cutlery, guns, &c.; has been manager and buyer for large retail business; also made cutlery a specialty; position in store or on the road with jobbers, manufacturers or manufacturers' agents. Address "BUILDERS' HARDWARE," office of *The Iron Age*, 59 Dearborn St., Chicago.

SOLE AGENCY for the East of some good hardware specialty; have an extensive acquaintance in the trade. "C. G. V.," No. 31, office of *The Iron Age*, 96-102 Reade St., New York.

BY AN EXPERIENCED hardwareman, buyer and office manager; fifteen years' active service; thoroughly versed in all the detail of general hardware, railroad, mill and mining supplies; competent by education and training to accept position of trust and responsibility; last nine years with present employers; references unexceptionable. "MANAGER," Box 31, office of *The Iron Age*, 96-102 Reade St., N. Y.

BY A SCIENTIFIC blast furnace manager, who has had charge of five (5) well known plants and can give first-class references, or would associate himself with an iron commission house, with the idea of becoming a partner if desirable to both parties. Address "MANAGER," office of *The Iron Age*, 220 S. 4th Street, Phila. Pa.

AS SUPERINTENDENT of wire mill, by a young man having 15 years' practical knowledge of the business; can get up all grades of wire, also erect new plants and furnish drawings for same; can give best of references, &c. Address "ALL GRADES," office of *The Iron Age*, 96 102 Reade St., New York.

SOUTH AFRICA.—The advertiser going to reside permanently in South Africa wishes to secure the agency for one or more firms doing an export trade with that country in hardware iron, steel or machinery; well educated; practical mechanic; business experience; best recommendations. Address "SOUTH AFRICA," office of *The Iron Age*, 96-102 Reade St., N. Y.

BY A THOROUGHLY competent mechanical engineer, with technical and general qualifications of a high order; knowledge of systematic methods of management, production and cost accounts, and large experience in the foundry, machine, engine and boiler trade, and the manufacture of brass and iron goods. "OPPORTUNITY," No. 31, office of *The Iron Age*, 96 102 Reade St., New York.

A BRASS FOUNDRY Foreman, an active, reliable temperate man, a practical and chemical mixer of all grades of metals, old and modern, and one who can produce sound, clear castings at a low cost, desires to better himself from present position. Address "B. F. FOREMAN," office of *The Iron Age*, 96-102 Reade St., New York.

BY MIDDLE AGED married man; has had years of experience as bookkeeper, special accountant and general office work in manufacturing business, well versed in details of foundry and machine shop work; excellent references. Address "WELL VERSED," office of *The Iron Age*, 96-102 Reade St., New York.

A MAN of many years' experience, has had charge of a large factory where various kinds of mechanical work has been done; well acquainted with handling a large number of workmen to good advantage, making prices, costs, &c.; would like to hear from some manufacturing house who want a sober, active man, with a practical experience; best of references. Address "I. A. C.," No. 222, office of *The Iron Age*, 96-102 Reade St., N. Y.

SELLING AGENCY WANTED, for blast furnace and iron and steel works products, by a gentleman having extensive acquaintance among railroads, foundries and shops. Address "AGENT," No. 111, office of *The Iron Age*, 96-102 Reade St., New York.

BY A THOROUGHLY competent and practical mill manager of the highest character; understands handling men and is a practical workman; has ten years' experience as a manager. Address "MANAGER," office of *The Iron Age*, 509-510 Hamilton Building, Pittsburgh, Pa.

AN EXPERIENCED hardwareman, age 34, who has had 12 years' experience as retail salesman and three years as traveling salesman, wishes position as traveling salesman to represent first-class house on the road, or would arrange with manufacturer to handle line of goods on commission, or specialties of merit. Address P. O. Box 280, Carlington, Ohio.

A MEMBER OF AMERICAN SOCIETY of Mechanical Engineers, who has had 20 years' practical experience as follows: machinist, head draughtsman, erector of steam plants, engineering, estimating, contracting and office work and superintendent of large engine works, is available for responsible position. Address "ENGINE WORKS," No. 16, office of *The Iron Age*, 96-102 Reade St., New York.

BY A PRACTICAL Blast Furnace Manager and Founder who can give best of references as to character and competency. Address "SCOTCH," office of *The Iron Age*, 96-102 Reade St., New York.

AS OFFICE MANAGER in a manufacturing company of moderate capital; foundry and machine shop preferred; would take an interest after a time if mutually desirable. Address "ENGINEER," No. 21, office of *The Iron Age*, 96-102 Reade St., New York.

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SPECIAL

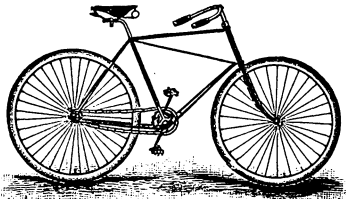
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P. O. Box 655 Hartford, Conn.

“The Winton is a Winner.”

A high grade, popular, easy selling line of wheels that stay sold. Sure winners for the dealer as well as the Rider.

WINTON DOUBLE FRAME.



Price, \$110.00.

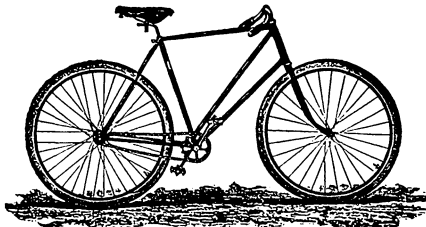
Hardwaremen are uniformly successful bicycle dealers, as the two lines naturally go together and it pays.

We want you with us. Our terms can't be beat. Drop a postal card and have a call from our salesman, “Mr. Catalog.”

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Agents for Michigan outside of Detroit.

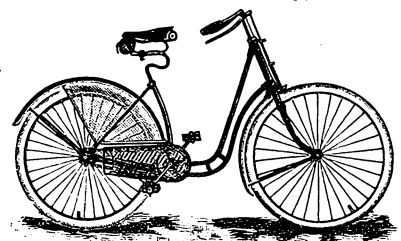
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Caution.—If you want the best be sure to get those stamped CHARLES BUCK. Leading jobbing houses in all parts of the country carry them in stock.

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Send for sample and description of our Handy Box of small gummed Letters and Figures, intended for labeling shelf boxes. Put up especially for the Hardware trade.

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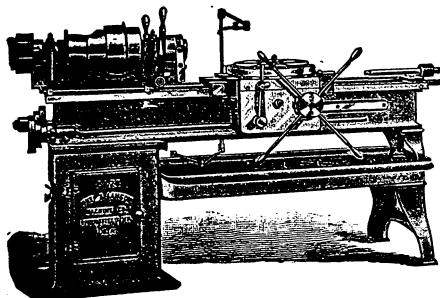
Controlling the Adams-Blair Process and other Steel and Iron Patents.

High Grade Open Hearth Steel produced by the Adams-Blair Process at less than the Cost of BESSEMER Steel.

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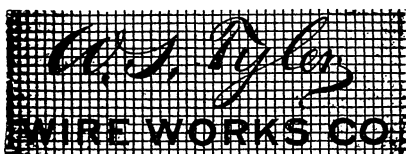
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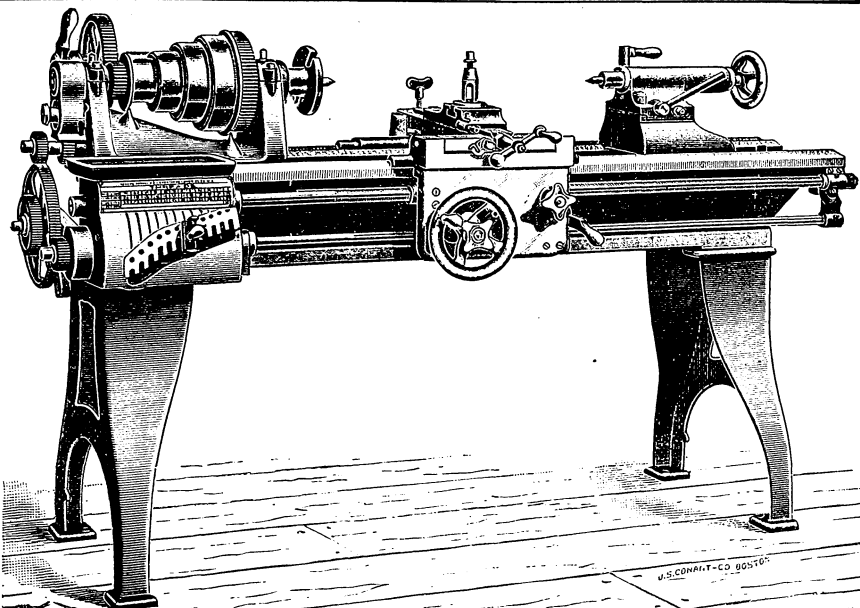
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The Pittsburgh Reduction Co.,

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Offer Aluminum guaranteed equal in purity to the best in the market, at lowest rates obtainable.

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A NEW FEATURE IN SCREW CUTTING ENGINE LATHES. THE HENDEY-NORTON LATHE.

This lathe cuts 12 different screws, from 6 to 20, without changing the gears, and feed changes from 36 to 120 cuts per inch without change. This cut shows a 1 1/4-inch x 6-foot Lathe. It has hollow spindle, 1-inch. Has compound or elevating rest, as preferred, or the double carriage rise and fall rest. Also taper attachment if desired. The carriage reverses for screw cutting without the use of the counter shaft, from the lever at the end of carriage, allowing the spindle to run in one continuous direction. In stock for immediate delivery, 14-inch, 16-inch and 18-inch; 20-inch and 30-inch in the works. Send for descriptive catalogue.

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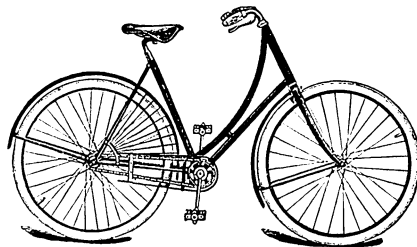
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BIG LATHES,

36, 42, 50 and 60 inch Swing.

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NEWARK, N. J.



The Stearns Wheel for ladies is a modification of the well known Stearns Models for men. That is all. It's enough, for it means volumes. E. C. Stearns & Co., Syracuse, N. Y., will furnish literature. Send for it.

"Slightly Disfigured, But Still in the Ring."



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We are now running full force, and turning out goods at a rate that will soon enable us to fill all orders promptly. Thanking you for your patronage in the past, and soliciting your orders for 1894, we remain, respectfully,

Chelsea, Mich., February 19, 1894.

THE GLAZIER STOVE CO.

We can guarantee prompt shipment of all orders after March 1st.

B. & B. STOVES, Always the Best, are Better than ever.

The Glazier Stove Co., Mfrs., CHELSEA, MICH.

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Hibbard, Spencer, Bartlett & Co., Chicago,	Northwestern "
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Prescott Brothers, Boston,	New England "
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WHITE MOUNTAIN FREEZERS.

— STILL IN THE LEAD. —

Freezers All Right. Prices All Right.

INQUIRE OF ANY LEADING JOBBER OR WRITE US.

The White Mountain Freezer Co., Nashua, N. H.

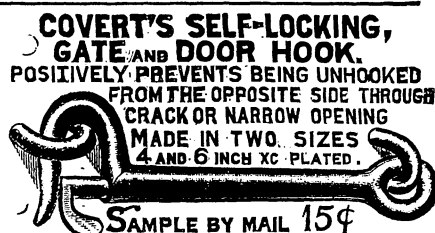


The true test of a Freezer is how well it performs its work; in this respect the unsolicited testimony of thousands pronounce the "Packer Freezers" unexcelled.

GOOD LUCK, STANDARD,
AND CONFECTIONERS' MACHINE FREEZERS.

The "Good Luck" is the latest and best low price Freezer on the market. Inside Castings Tinned, Malleable Iron Fittings, Automatic Scraper. White Cedar Pails with Galvanized Steel Hoops. Fine Pails, or Wire Rings with bottom of pail unprotected are not used.

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POSITIVELY PREVENTS BEING UNHOOKED FROM THE OPPOSITE SIDE THROUGH CRACK OR NARROW OPENING
MADE IN TWO SIZES
4 AND 6 INCH XC PLATED.

SAMPLE BY MAIL 15¢

Call for Our Banner Bolt Snap.

This snap has many important advantages over other makes of Bolt Snaps, viz.: It is lighter, the spring is entirely covered and protected from foreign substances and freezing, and is lower in price.

Made in all sizes; Round, Loop and Open Eye. We are headquarters and the most extensive manufacturers in Saddlery, Coach and General Hardware Specialties.

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FARMER, N. Y., U. S. A.

**Hardware Dealers
Can Profitably
SELL BICYCLES.**

There is a large trade in Bicycles in all parts of the country and much of that trade naturally belongs to dealers in hardware. Good bicycles meet with a ready sale and pay a fair percentage of profit.

COLUMBIAS

Are the representative high grade machines in America. A Columbia is the easiest machine to sell to the best trade because it is unquestionably the standard wheel of the world.

We want enterprising agents of good standing and solicit correspondence.

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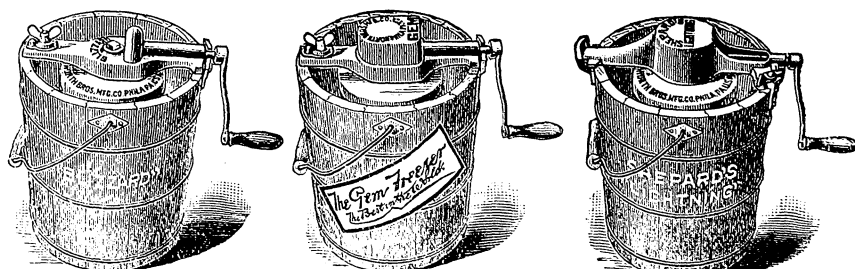
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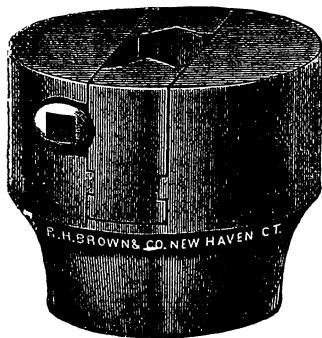
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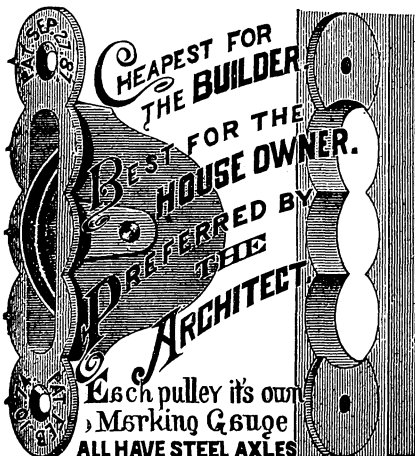
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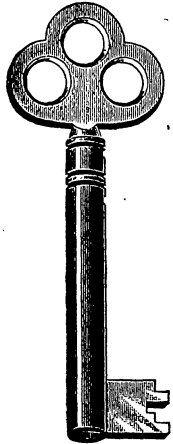
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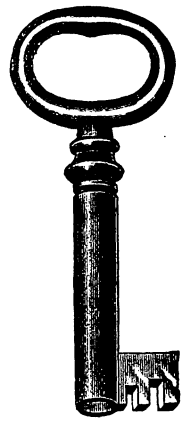
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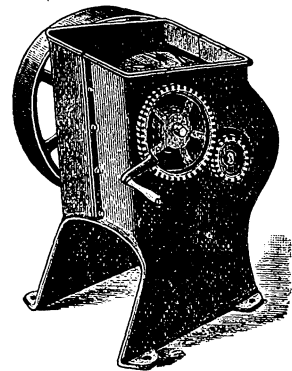
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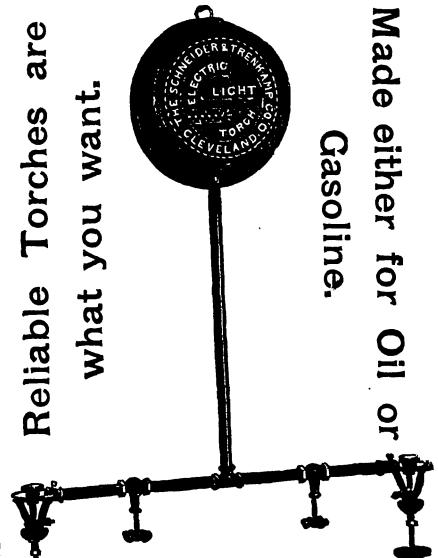


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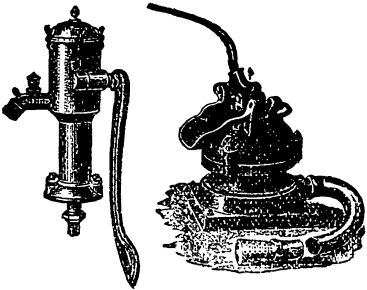
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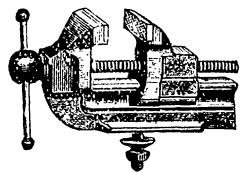
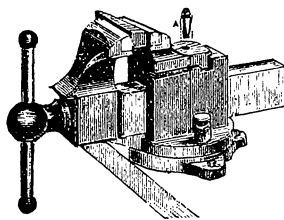
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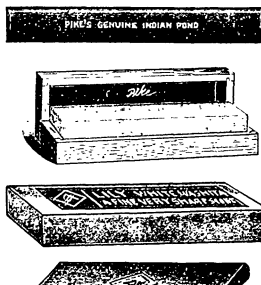
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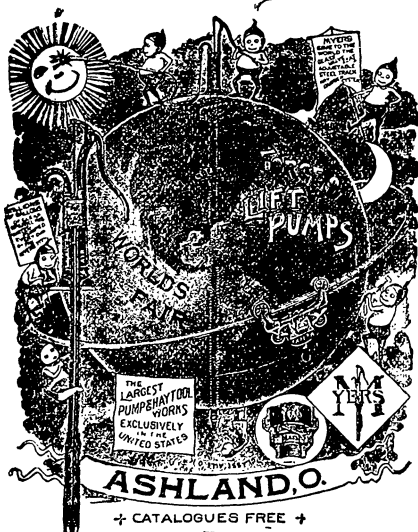
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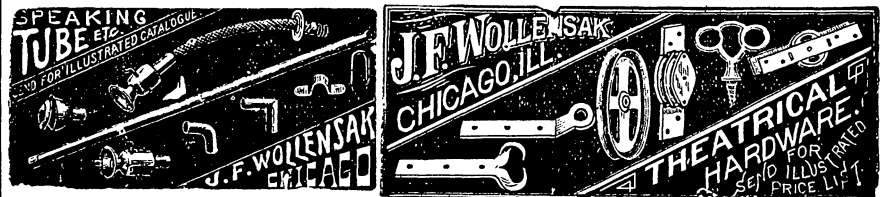
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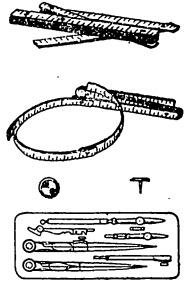
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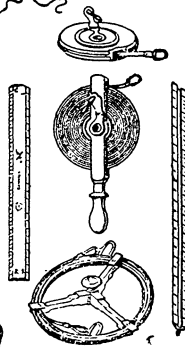
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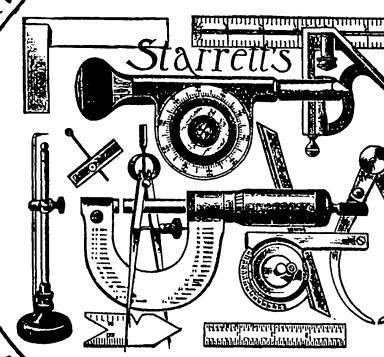
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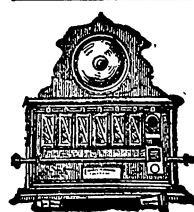
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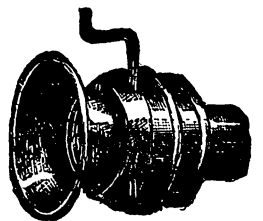


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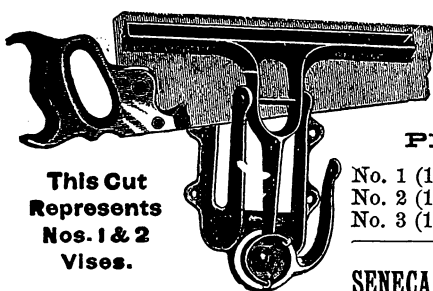
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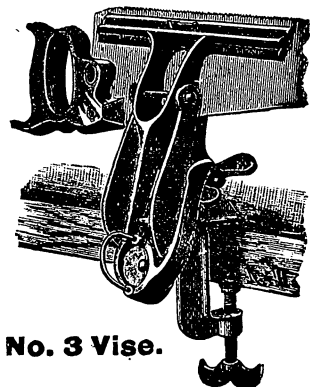
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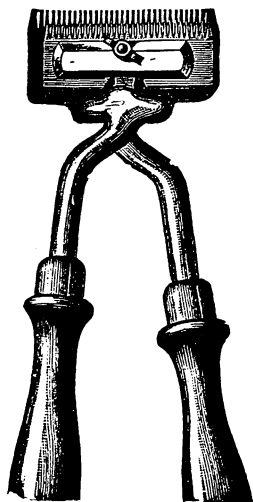
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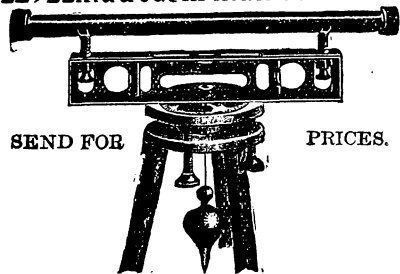


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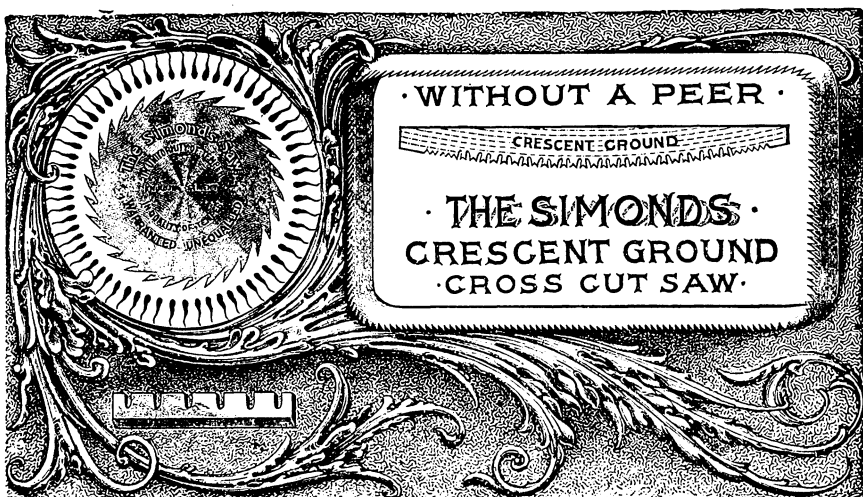
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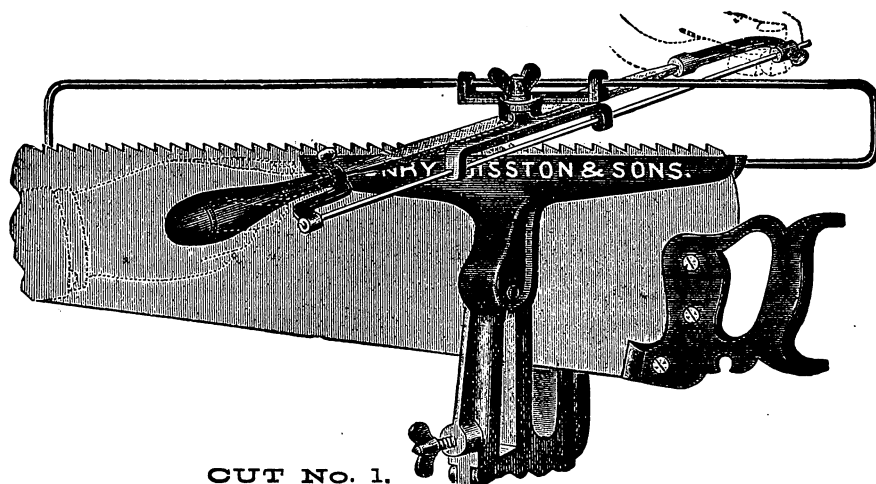
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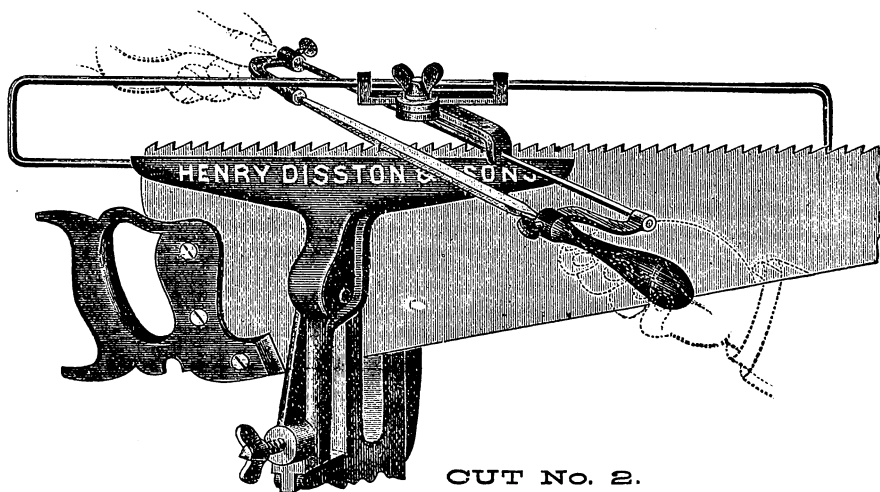
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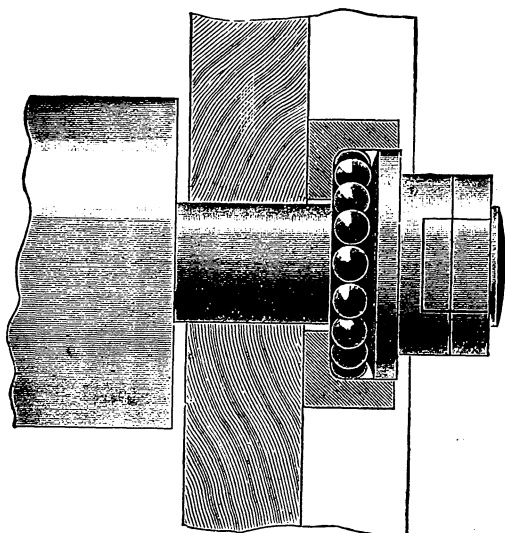
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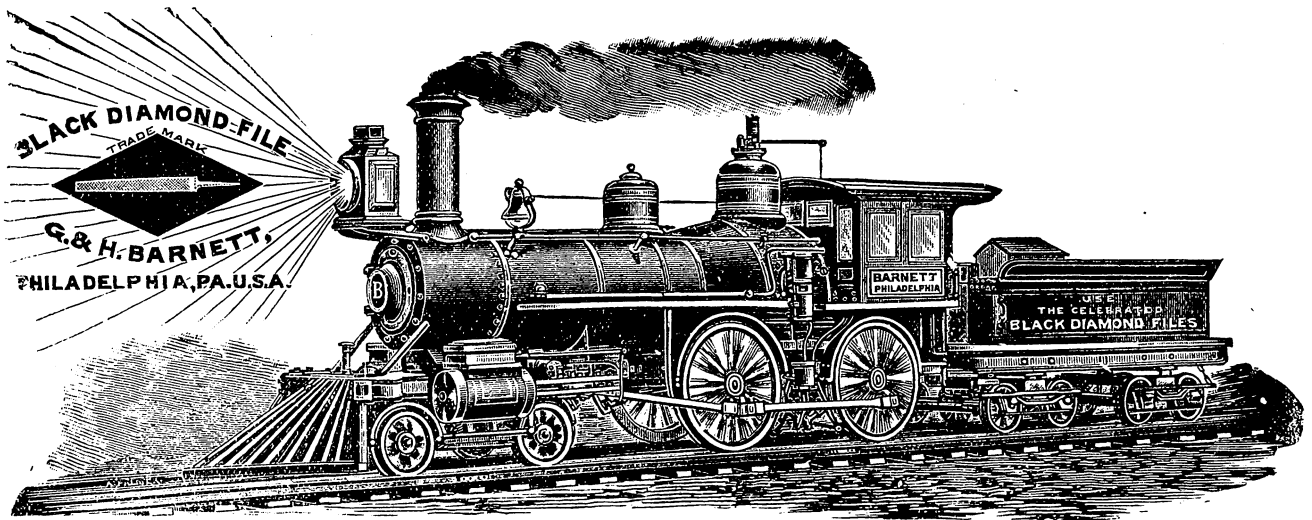
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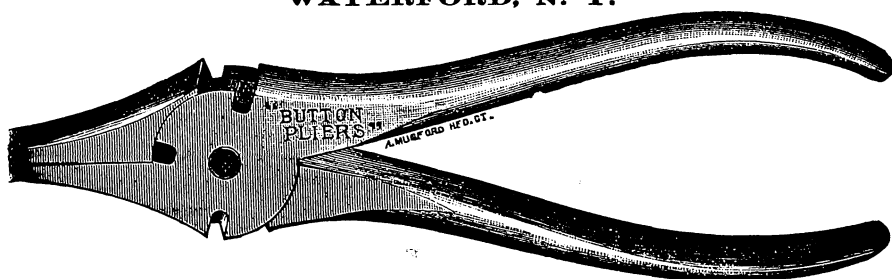
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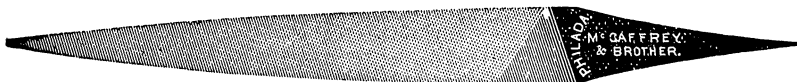
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THEIR MAKE IS EQUAL TO ANY OTHER
IF NOT SUPERIOR
TO ANY OTHER
HAVE BEEN IN BUSINESS SINCE 1840.

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Have established and maintained their reputation, for superiority,
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Established 1836.

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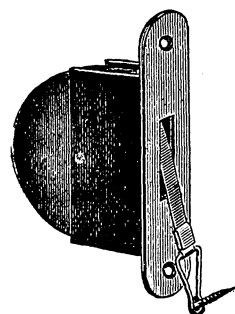
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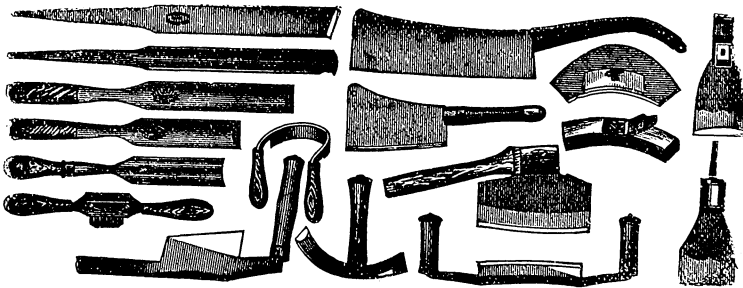
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Will mark price &c., on cutlery.

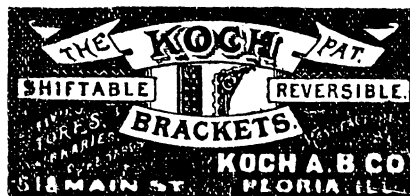
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Flows from Pen as readily as ink.

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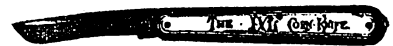
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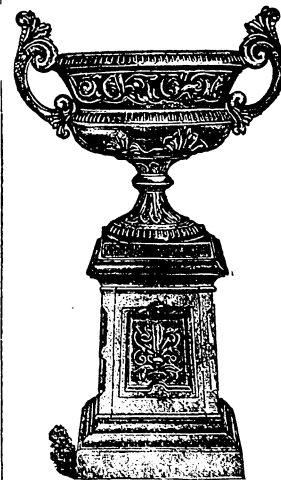
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SEND TO

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Nearly 100
styles and
sizes.

List prices
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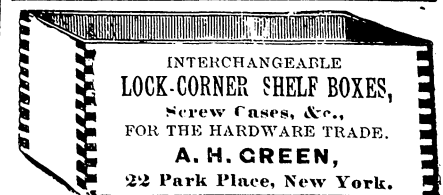
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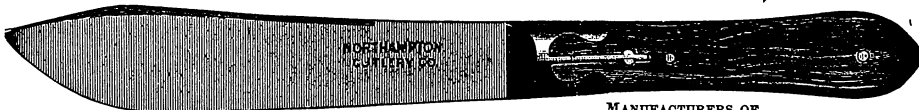
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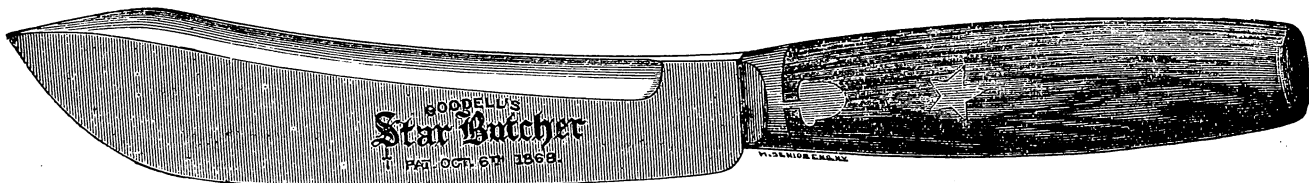
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WE DON'T KNOW HOW TO IMPROVE IT.

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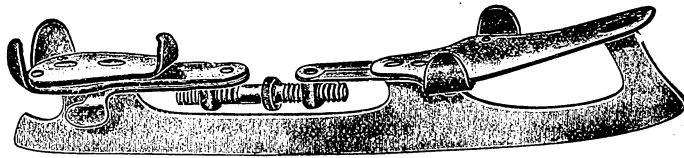
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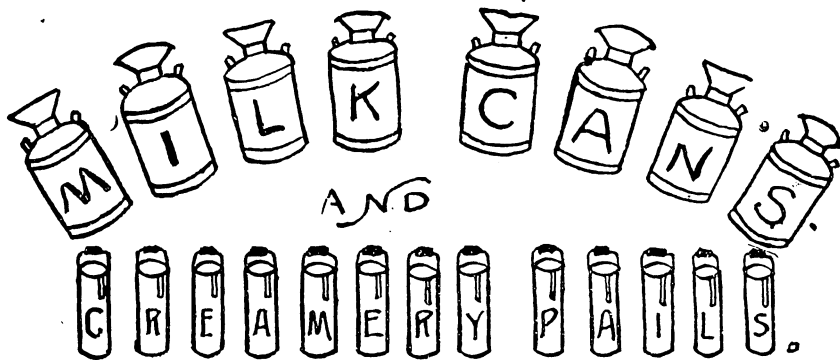


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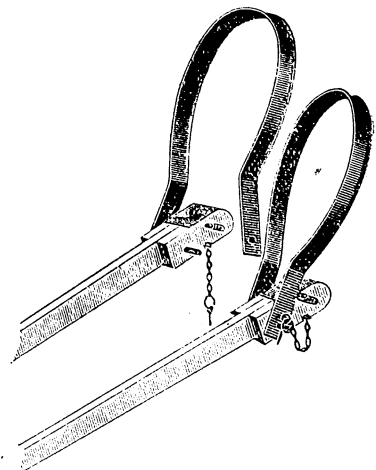
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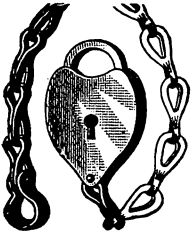
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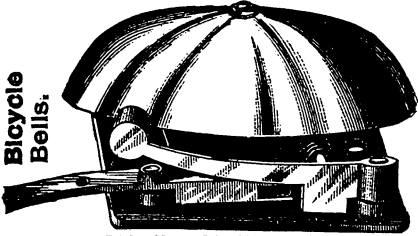


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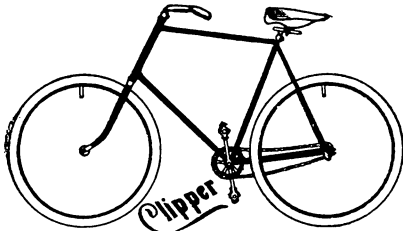
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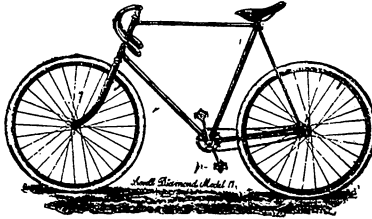
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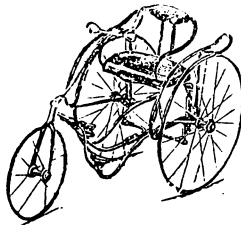
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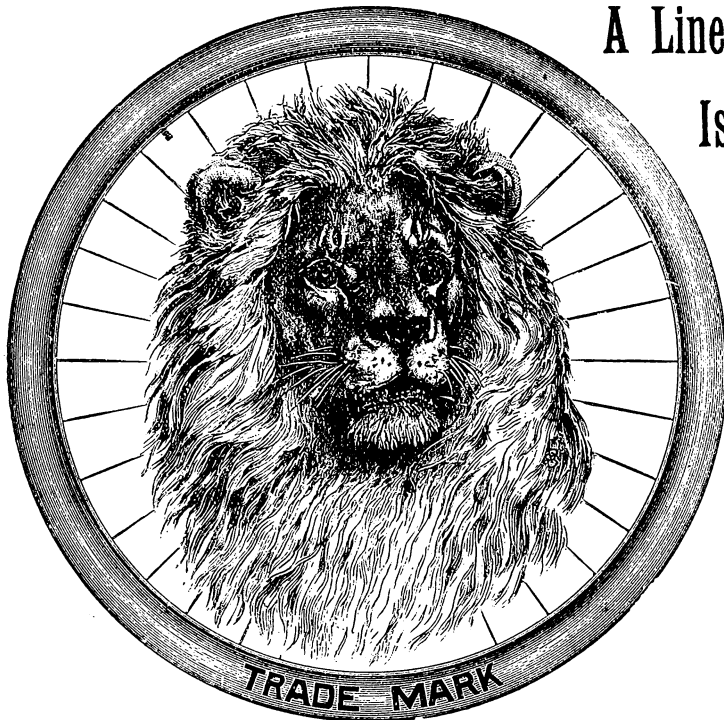
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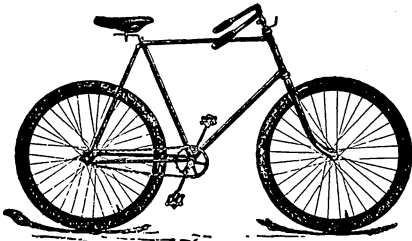
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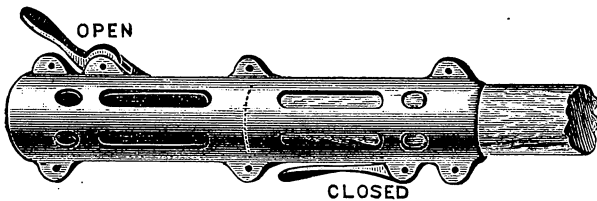
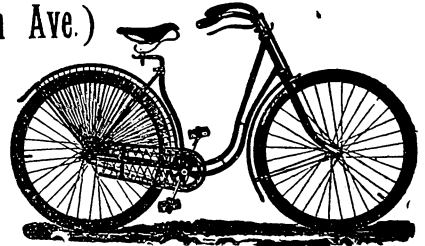
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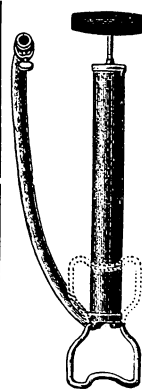
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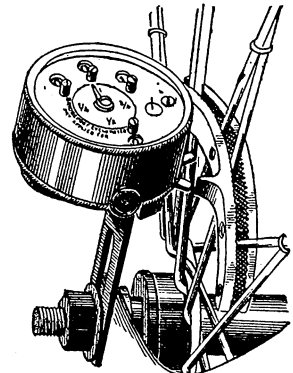
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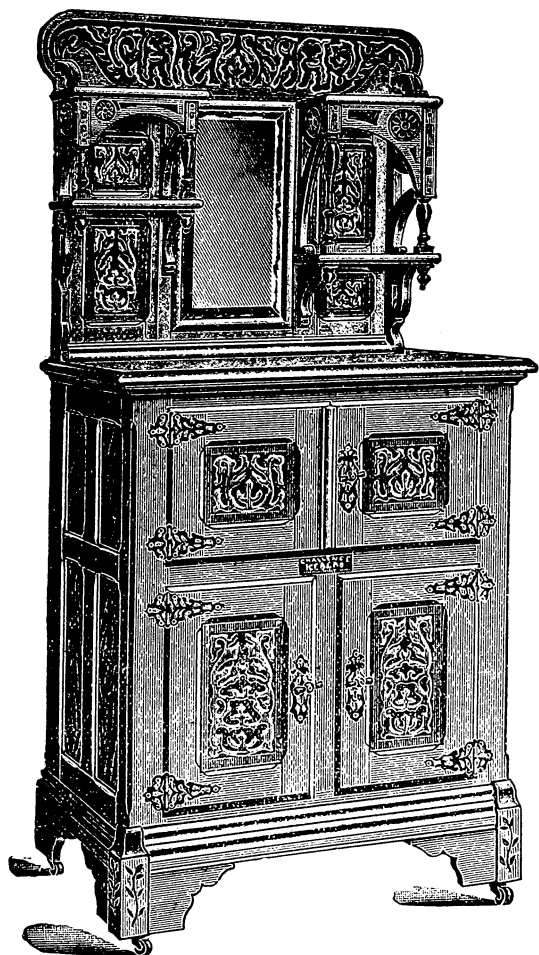
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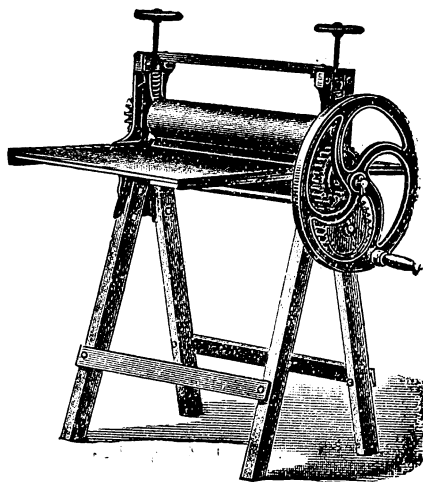
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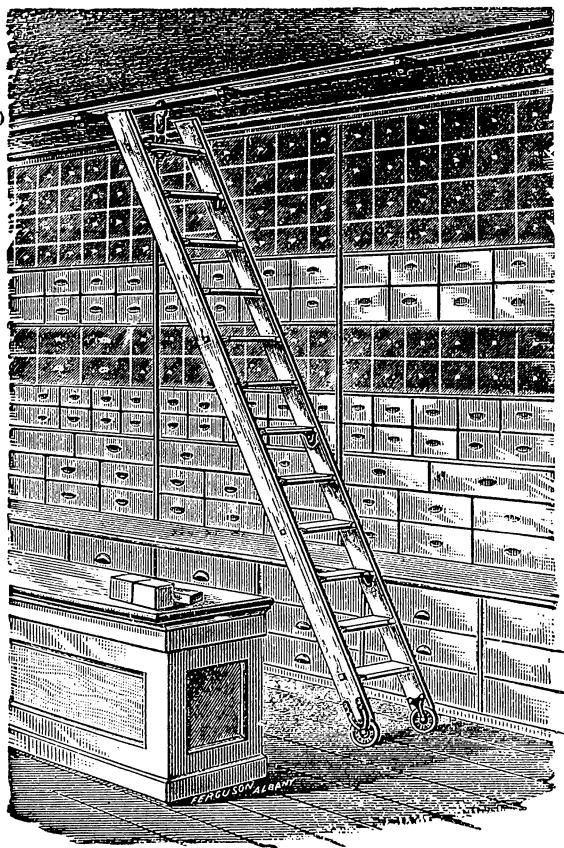
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"SOLID-STEEL" SEAMLESS HOLLOW WARE.

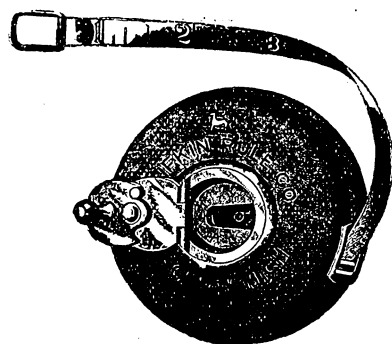


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We do Light and Heavy Stamping and Blanking. Also build Dies and Stamping Machinery.



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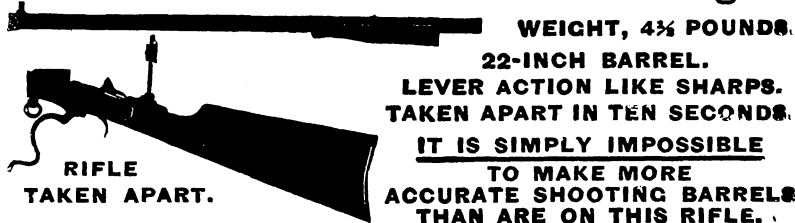
Entirely new. Handle or crank when closed is perfectly flush with leather case. Opens by pressing button on opposite side and folds out double, giving increased leverage. Best and most convenient steel tape on the market. Fully guaranteed. Will send samples on approval. We carry a complete stock of our goods at our New York Office, 20 Murray St.

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A Triumph in Small Bore Rifles. STEVENS' "FAVORITE" RIFLE.



Made for the 22 or 25 Rim Fire Cartridge.

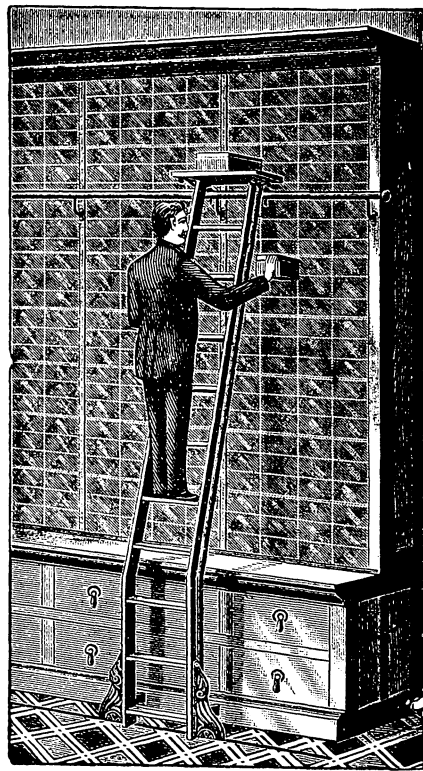


- No. 17. Plain Open Sights.....\$12.50
- No. 18. Vernier, Open Back, and Beach Front Sights..... 17.00
- No. 19. Lyman Peep, Open Back, and Lyman Front Sights, 17.00

A 60 Page Catalog showing our full line of Fire Arms with TRADE PRICE LIST sent with pleasure to all dealers.

J. Stevens Arms & Tool Co.,

P. O. Box 5729.
Chicopee Falls, Mass. U. S. A.



FLOOR TRACK BICYCLE LADDER.

Highest Award Columbian Exposition. No other Ladder Service can approach the "Bicycle" in ease and convenience of operation. Compared with others they work like a bicycle beside a lumber wagon. Can be applied to any kind of shelving made. See this space next week for other styles. Send for Illustrated Catalogue and prices to THE BICYCLE STEP LADDER CO., 50 State street, Chicago, Ill.

—: OUR:—

PURE ALUMINUM COOKING UTENSILS

Meeting with such universal appreciation, we think it to our interest to appoint ONE responsible firm of Hardware Merchants in EACH town and city as our sole agents.

ILLINOIS PURE ALUMINUM CO.,
LEMONT, ILLINOIS.
Manufacturers of Sheets, Medals, Utensils.

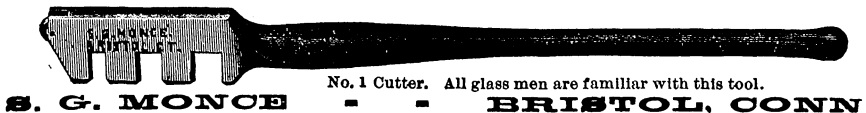
HOWARD IRON WORKS,
BUFFALO, N. Y.

Manufacturers of

BENCH VISES.

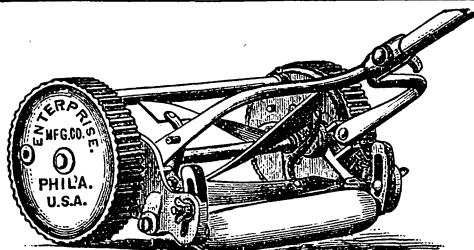
Price Lists sent on application.

MONCE'S NOVELTY GLASS CUTTERS. — INTERCHANGEABLE LOCK STENCILS



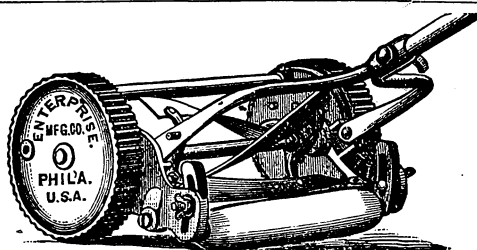
THE ENTERPRISE M'F'G CO. OF PA.,

Third and Dauphin Sts.,
Philadelphia, U. S. A.

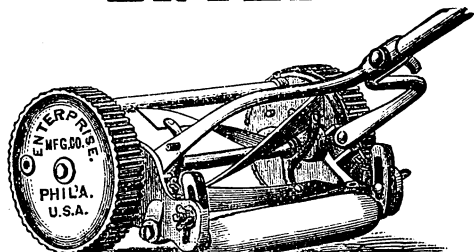


7, 9, 11, 13, 15 inches.

—O—
PAINTED
and
TINNED.

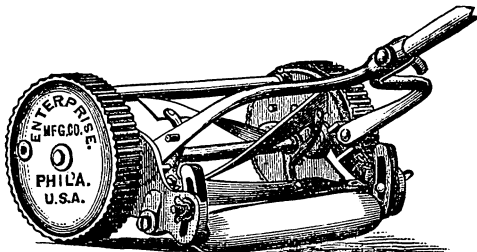


ENTERPRISE LAWN MOWERS!



EQUAL TO
the
BEST.

—O—
Prices quoted
on Application.



FOR SALE BY THE HARDWARE TRADE.

Branch Office and Warehouse with J. C. McCarty & Co., 97 Chambers Street, New York City.

SEND FOR CATALOGUE, FREE.

"Strapped."



Patented Aug. 26, 1886.

Victor Well Bucket.

Hoops cannot come off.
Bucket cannot fall down.
Strap hooks under bottom of stave, goes
over each hoop, and is securely riveted to
side of bucket.

Shall we send you our Catalogue and Prices?

Richmond Cedar Works,

Manufacturers of Wooden Ware,

RICHMOND, - - VA.

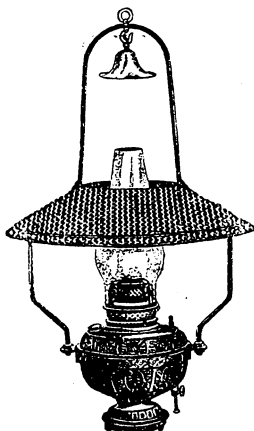
American Stamping Co.,

Manufacturers of

All Kinds of Tinware and Sheet
Metal Goods.

N. Y. Office and Salesroom, 104 & 106 John St.
Factory, 103 to 119 N. 3d St., Brooklyn, E. D., N. Y.

THE LAMP TO LIGHT YOUR STORE. MAMMOTH CENTRAL DRAFT BANNER.



With 20-inch Tin Shade.

No. 858. Size 3.

Enlarged Oil Pot

No Smoke.

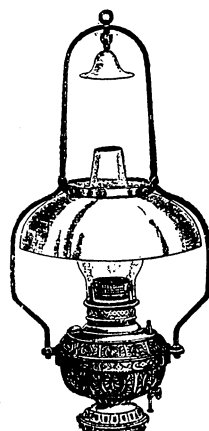
No Smell.

Cheaper and Better than Gas.

300 Candle Power.

Holds One Gallon Oil.

Burns Brightly about 10 hours.



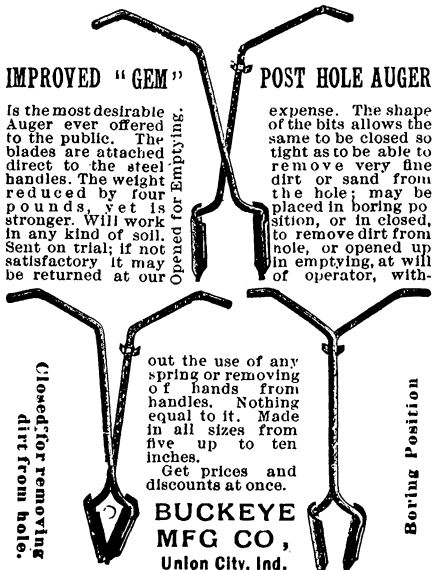
With 14-inch Dome Shade.

The Banner is the only Fount having Extra Feeder Wick which supplies oil to the Burning Wick Harp has our Patent Extension Band, allowing Fount to pass down and through instead of lifting over as in the old style harp. Flame is regulated by our Improved Ratchet Movement. This Movement gives an exactness and nicety in adjusting that is not possible in any other wick raising device.

—MANUFACTURED ONLY BY—

THE PLUME & ATWOOD MFG. CO.,

NEW YORK. BOSTON. CHICAGO.



IMPROVED "GEM"

Is the most desirable
Auger ever offered to
the public. The
blades are attached
direct to the steel
handles. The weight
reduced by four
pounds, yet is
stronger. Will work
in any kind of soil.
Sent on trial; if not
satisfactory it may
be returned at our

POST HOLE AUGER

expense. The shape
of the bits allows the
same to be closed so
tight as to be able to
remove very fine
dirt or sand from
the hole; may be
placed in boring po-
sition, or in closed,
to remove dirt from
hole, or opened up
in emptying, at will
of operator, with-

Closed for removing
dirt from hole.

out the use of any
spring or removing
of hands from
handles. Nothing
equal to it. Made
in all sizes from
five up to ten
inches.
Get prices and
discounts at once.

**BUCKEYE
MFG CO,**
Union City, Ind.

Boring Position

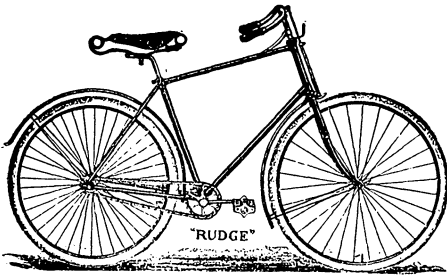


WM. KROGSrud,
Engraver and Die Sinker,
61 Fulton St., N. Y.
Manufacturer of
STEEL STAMPS
For Every Purpose.
Steel Letters and Figures.
Burning Brands, Stencils,
&c. Send for Illustrated
Catalogue.



3 NICKLE, Silver and Bronze Metallic
Figures and Letters, Sizes 1/2 in to 3 in.
Pattern Letters, Steel Stamps, Brands.
Dies &c. Send for Reduced Price List.
We make a specialty of the Hardware Trade.
A. A. WHITE & CO., Providence, R. I.

CHAS. W. HOEFIG,
ENGRAVER AND DIE SINKER,
52 FULTON ST., - N. Y.
STEEL STAMPS,
BRASS DIES, BURNING BRANDS, &c.
Designs on Steel Finely Executed.



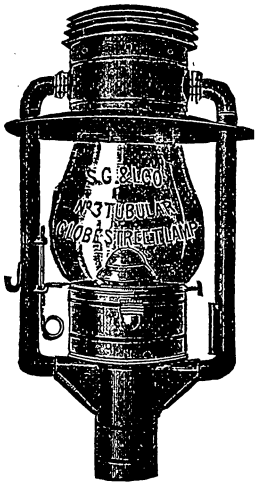
HARDWARE DEALERS AND RUDGE CYCLES.

Agents wanted immediately for unoccupied territory. Write for illustrated catalogue and Price-list of 1894 Wheels.

The Bronson Supply Co.,

Sole Agents for the United States.

72 Beekman St., New York.



No. 3

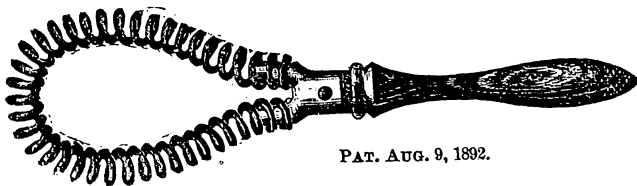
Globe Street Lamp.

Light your Streets and Driveways. The S. G. & L. CO. Tubular Globe Street Lamp

IS THE Best Street Lamp Manufactured.
Equal to the best Gas Light.
Will not Blow Out in the Strongest Wind.
Will not Smoke.
Will not Freeze.
Automatic Extinguisher.
Outside Wick Regulator.
Will Burn Four Hours for One Cent.

MANUFACTURED BY
STEAM GAUGE AND LANTERN CO.,
SYRACUSE, N. Y.
Western Branch, 25 Lake St., Chicago, Ill.

THE BOSS DUST BEATER.



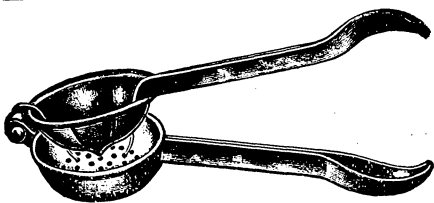
PAT. AUG. 9, 1892.

NEAT, DURABLE, AND DOES THE BUSINESS.

For removing dust and filth from Clothing, Upholstered Furniture, Rugs and Carpets it is just the thing. Will raise the nap and so improve the appearance. Will not, like other Dust Beaters, leave marks, nor tear the fabric. The coil is of steel wire secured in a malleable iron socket and attached to an enameled wooden handle. Just what everybody wants.

Sent by Mail, 35 Cents.

PEABODY & PARKS,
Manufacturers, **TROY, N. Y.**



Do you make Lemonade?

If so you want our Squeezer. Positively the best. Suitable for any size Lemon. Write for catalogue and prices.

BERGER BROS., 237 Arch St., Philadelphia, Pa.

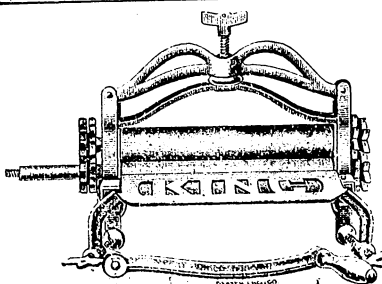
COLBY WRINGER CO., - Montpelier, Vt.

MANUFACTURERS OF THE

PREMIUM WRINGER,

With Automatic Apron Adjustment.

SURPLESS, DUNN & ALDER, DIRECT REPRESENTATIVES,
87 Chambers Street, New York.



We are sole manufacturers of the celebrated

Erie and King Wringers.

We also make all other brands of Wood and Iron Frame Wringers.

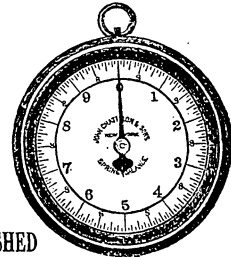
Exclusive sale of Erie and King Wringers given to one dealer in each town.

WRITE FOR CATALOGUE.

The National Wringer Co., Canton, O.

John Chatillon & Sons,

85, 87, 89, 91, 93 CLIFF ST., NEW YORK.



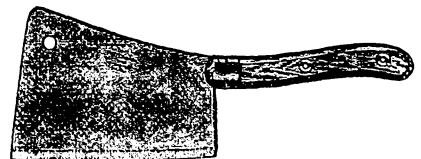
ESTABLISHED

1835.

SEND FOR
PRICE-LIST.



Sole Agents for
Foster Bros.' Butchers' Cutlery.



John Chatillon & Sons, N. Y.



THE
KNAPP & COWLES
MFG. CO.,
Bridgeport, Conn..
Makers of a large line of
STANDARD
Hardware Specialties.
SEND FOR
K Catalogue.

AMERICAN TOOL COMPANY,
NEW YORK,
MANUFACTURERS OF

TOOL CHESTS


Of all sizes, complete with tools, for Hardware, Toy, Notion and Variety trades.
Factory and Salesroom,
200 West Houston Street, near Varick.
Also Machinists' Tool Chests, empty. Illustrated Catalogue and prices furnished on application.

NEW
and the
BEST.

"THE HUSTLER"

NEW
and the
BEST.

Post Hole Digger.

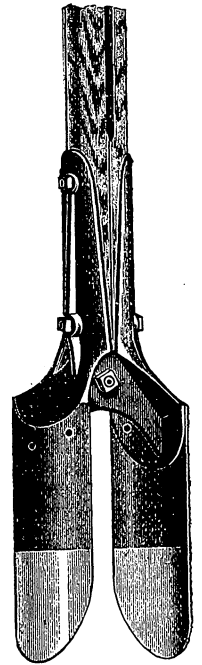
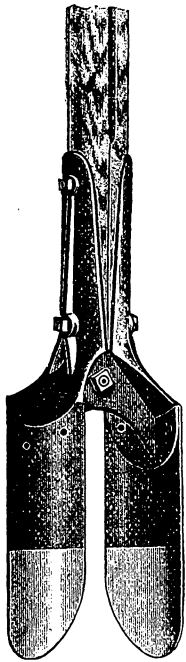
 **BUILT FOR BUSINESS.** 

This tool combines simplicity with correct form for easy and rapid digging. It is neat in design, finely finished, strong and durable.

The single round handle opens in halves to operate, being easily grasped and less tiresome than two separate handles; all other movements of split handles are liable to pinch the operator's hands.

This special style of bolting handles to shanks in round form enables them always to be kept tight in case of shrinkage. A shoulder is provided at the bottom to receive the full thrust, instead of on the bolts. This is not found in other makes, and prevents handles from splitting.

The best materials only are used. Fully guaranteed.



5 — Other Styles of Post Hole Diggers to — 5
Suit all Soils.

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JOHN H. GRAHAM & CO..

**113 Chambers St.,
NEW YORK.**

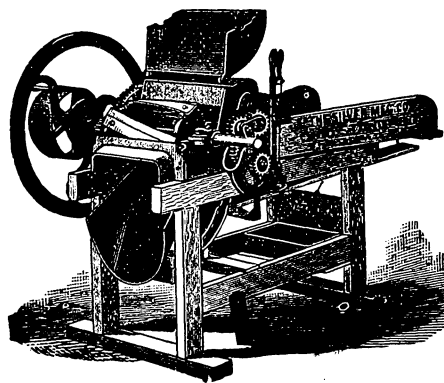
READING HARDWARE COMPANY.

*The fact that "Vassar"
Cylinder Locks are specified
by our prominent Architects
is convincing evidence
that they are*

Safest and Best.

NEW YORK, PHILA., CHICAGO.

Factories, READING, PA.

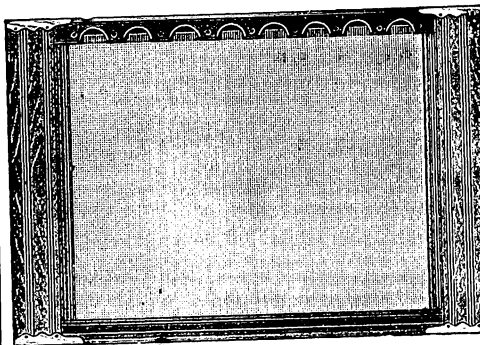


THE "OHIO" Feed and
Ensilage Cutters and Car-
riers are the best.

By reason of wide open throat
and improved feeding device
(being full width of cutting sur-
face, all sizes), our machines
have greater capacity than others.

THE SILVER MFG. CO. Salem, O.

EMPIRE "A" WINDOW SCREEN.
WITH PATENT FLY ESCAPE. (Patented Aug. 16, 1892.) MADE IN EIGHT SIZES.



The only screen made that will keep a house
free from flies. Any ordinary screen will keep
flies out, but are just as effectual to keep them
in. With this screen, while it will keep them
out, it will also allow them to get out. As shown
by the cut, the principle is the same as in
the well-known balloon fly trap, constructed
with openings in top of frame leading up and
out. Flies light on the screen and follow the
wire cloth up to these openings and thus find
their way out. Flies will not go down through
small openings and therefore will not return
by the way they went out. Well and strongly
made of hard wood finished in oil. Extensions
are operated by steel springs so they can be
placed either under or just on outside of sash.
If placed outside of sash pressure of springs
holds them in place and window can be raised
and lowered without removing screen. Corn-
ers of screens covered and strengthened with
iron caps as shown on cut. These caps are
covered with a bronze paint, which while add-
ing very much to the appearance of the
screen, makes it the strongest and most dur-
able window screen made.

Also EMPIRE SCREEN DOORS, With Patent Fly Escape, on same principle as Window Screens described
above. NEW YORK AGENTS:
White, Van Glahn & Co., Dealers in General Hardware, 15-16-17 Chatham Sq., N. Y.

Porcelain Lined Lemon Squeezers



Best Common Mouse Traps, Steak Hammers,
Boot Jacks, Lap Boards, Beacon Hill Pat. Mouse
Traps, Mallets, Bung Starters, Hand Screws.
Ripley Mfg. Co., Unionville, Conn.

BOOKS

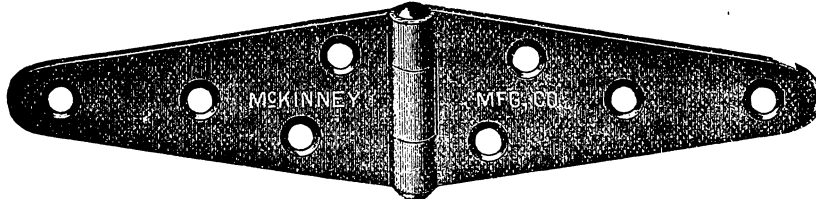
THE NEWEST BOOKS ON Iron, Steel and Metallurgy
Mining, Mechanical and Civil Engineering; Casting and
Founding; Electricity and Electric Lighting, promptly
supplied on receipt of price by
DAVID WILLIAMS, 96-102 Reade St., New York.

STEEL HINGES AND BUTTS.

— STANDARD GOODS. —

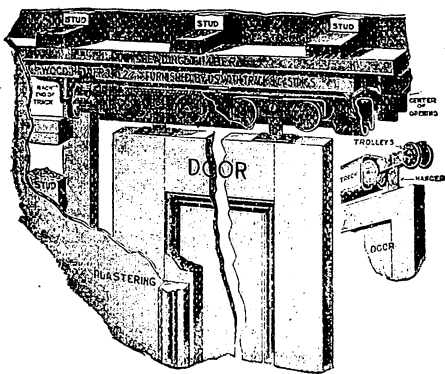
McKINNEY MFG. CO., - ALLEGHENY, PENN.

SEND FOR
LIST.



ORDERS FILLED
ON SIGHT.

"NONE BETTER."



PARLOR DOOR HANGERS

The adjustment is in the Track and not in the Hanger, as in other fixtures.

Track can be taken out of Pocket and replaced without defacing walls after house is finished.

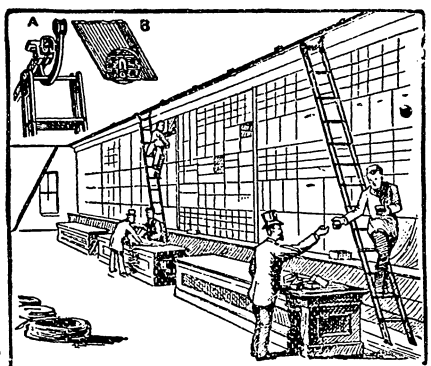
HIGHEST AWARD
AT WORLD'S FAIR 1893.

— ON —

Parlor, Barn and Fire Door Hangers
SEND FOR CATALOGUE.

COBURN TROLLEY TRACK MFG. CO.,
HOLYOKE, MASS.

We make four styles of Rolling Ladders to reach shelving of any height.



P. & F. CORBIN,

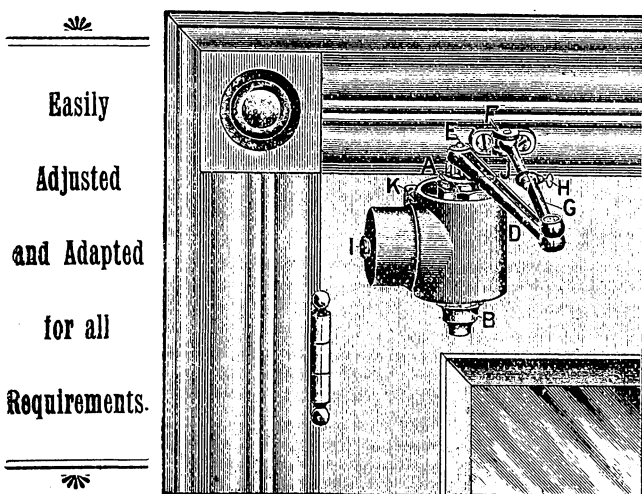
New Britain, Conn.

New York.

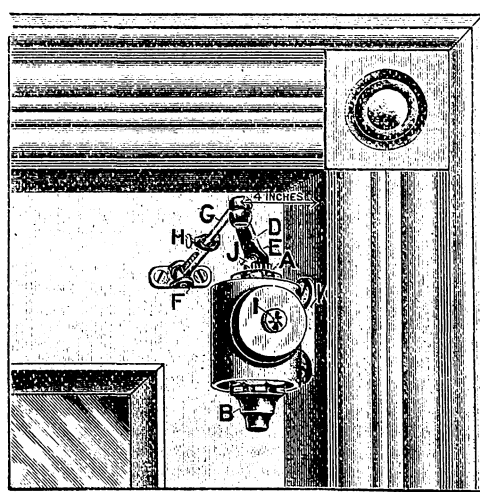
Philadelphia.

Chicago.

—) MANUFACTURERS OF (—



Easily
Adjusted
and Adapted
for all
Requirements.

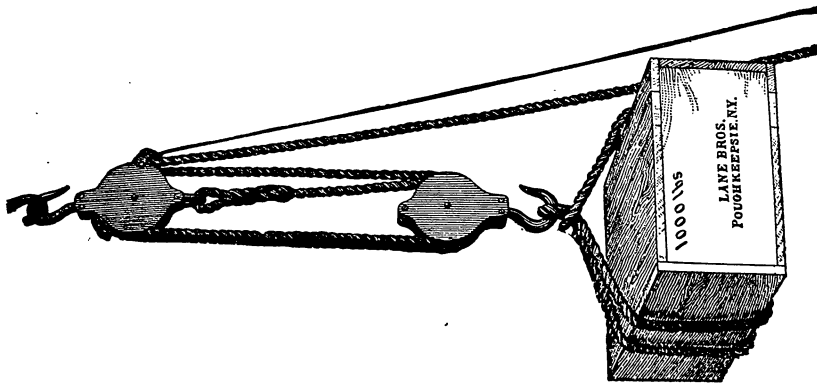


Looks Well,
Acts Well,
Wears Well.

LIQUID DOOR CHECKS AND SPRINGS,

Fine Builders' Hardware. Wood AND Machine Screws.

Catalogues and Prices Furnished on Application.



LANE'S SELF-LOCKING TACKLE BLOCKS,

Anti-Friction Steel Bushings,

Holds the load at any point, and always sure.

SEND FOR CIRCULAR.

For sale by the Hardware trade.

—MANUFACTURED BY—

LANE BROS.
POUGHKEEPSIE, N. Y.

SIMPLEST IN CONSTRUCTION.
EASIEST FITTED.



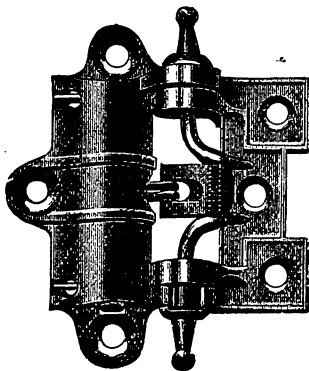
Cheapest and Best
Balance Made.

WRITE FOR CATALOGUE.

The Vanderbilt Sash Balance Co.,
CANANDAIGUA, N. Y.
General Agents, Harmon & Dixon, 118 Chambers St.
New York.

NEW IDEA SPRING HINGE

Holds the door strongest when
closed.



Resistance gradually de-
creases in opening

and increases in closing the door.

A covered (patented) hold-back Spring Hinge. Full
particulars, free Sample and Prices by mentioning
this paper.

STOVER MANUFACTURING CO.,

145 River St., Freeport, Ill.

SASH WEIGHTS

E. E. BROWN & CO.,

McKean and Meadow Sts.,

PHILADELPHIA, PA.

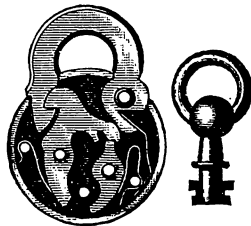
THE WILCOX & HOWE COMPANY,
BIRMINGHAM, CONN.,

MANUFACTURERS OF

A Full Line of Carriage Hardware
ALSO SPECIAL FORGINGS.

Estimates cheerfully given. Send for Catalogue

PATENT PERFECTION PADLOCK.



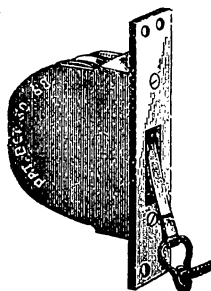
Eight Tumblers, Key Turning Both Ways.

Sizes, $\frac{1}{4}$ inch to $2\frac{1}{4}$ inches, of cast bronze. Defies competition
for quality and price. No steel or iron used, cannot rust, and can-
not be picked. Also, $\frac{1}{2}$ and $\frac{3}{4}$ inch Padlocks, opened with a com-
mon pin, in brass and nickel, for cats and small dogs. The best
Railroad Switch and Car Lock in the world.

Adopted by the United States Treasury for bonded warehouses.

AMES SWORD CO., Chicopee, Mass.

Send for Price-Lists and Circulars.



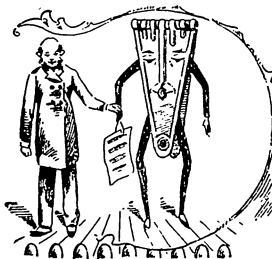
DOES IT PAY?

To buy an inferior article, which your
trade condemns, when you can get

THE CALDWELL SASH BALANCE.

The best material, right principle and
care in making and testing have made
it the LEADER for five years. Write to

CALDWELL MFG. CO., Rochester, N. Y.



Introducing the Celebrated

Corrugated Steel Hinge,

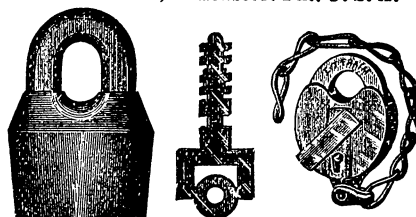
—MADE BY:—

THE STANLEY WORKS, New Britain, Conn.
79 Chambers St., N. Y.

Send for "BIOGRAPHY OF A YANKEE HINGE." Mailed free.

KEYSTONE LOCK WORKS,

E. T. FRAM, Lancaster, Pa., U. S. A.



Originators, designers, patentees and manufacturers
of all the leading popular styles of **PADLOCKS**,
Key-Locking Scandinavian with our patent Inter-
Locking Tumblers; the only reliable lock of this style
ever made. **SELF-LOCKING** Scandinavian of
the highest type of perfection. Dust Proof Railroad,
Freight Car and Switch Padlocks. Brass, Bronze,
Steel and Malleable Iron Padlocks for all purposes and
in all finishes. 131 different kinds. Write for our new
100-page catalogue.

SURPLESS, DUNN & ALDER, General Agents,
97 Chambers St., NEW YORK.

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BY S. H. TERRY.

406 PAGES, 5 x 7 $\frac{1}{2}$ INCHES.
POST-PAID, \$1.50.

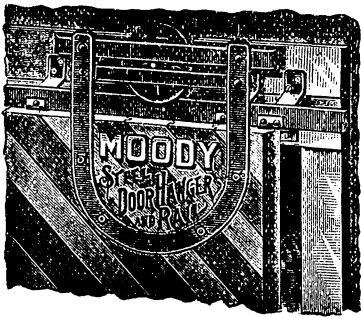
Among the subjects discussed are: The selection
of a business; choice of a locality; buying a
stock of goods examining, marking and ar-
ranging goods how to advertise; employ-
ment of clerks selling for cash and credit;
keeping accounts; expenses; copartnerships;
losses by fire, theft, &c.; influences of social
life on business; buying at auction; invest-
ment of profits; insolvency; business qual-
ifications

FOR SALE BY

DAVID WILLIAMS, Publisher and Bookseller

96-102 Reade St., New York

VICTOR MFG. CO., Newburyport, Mass.

STEEL RAIL.

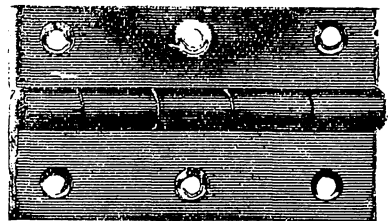
Showing one-half set of hangers attached to door.



The Only Bracing Bracket Made.

PRICE-LIST.

HANGERS.	Per Doz. prs.
No. 5, to run 6 feet, 3 1/4 in. wheel,	\$10.00
No. 6, to run 10 feet, 4 1/4 in. wheel,	15.00
No. 7, to run 15 feet, 5 1/4 in. wheel,	22.00
RAIL, per foot.....	6 1/2 cents.

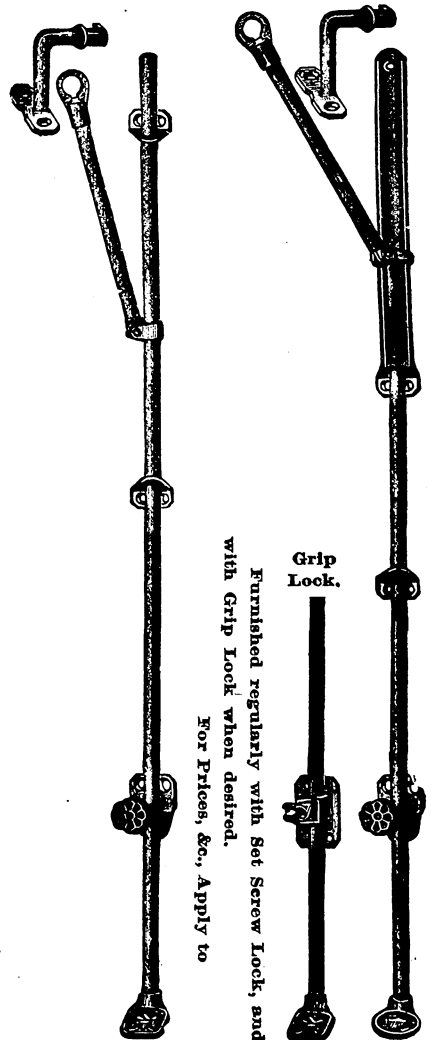
**Cast Brass Butt Hinges**

IN STOCK AND FOR SALE BY

W. & J. TIEBOUT,

Nos. 16 & 18 Chambers Street, New York,

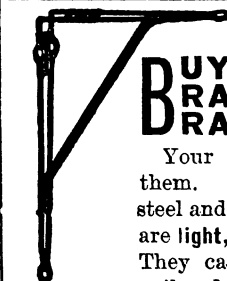
MANUFACTURERS OF

**BRASS, GALVANIZED & SHIP CHANDLERY
HARDWARE.****TRANSOMLIFTERS****"EAGLE."****"SHIELD."**

Grip
Lock.

Furnished regularly with Set Screw Lock, and with Grip Lock when desired.

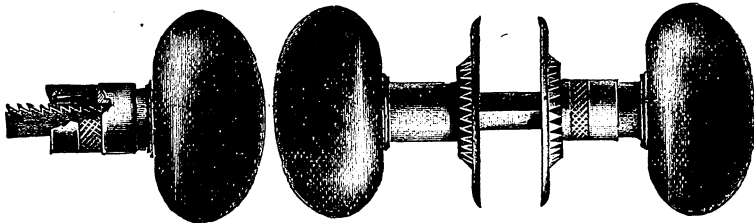
For Prices, &c., Apply to

J. F. WOLLENSAK, PATENTEE
CHICAGO, ILLINOIS.
PAT. NOV. 8,
1892.**BUY
BRADLEY
BRACKETS!!!**

Your Customers will like them. They are made of steel and are not brittle. They are light, strong and artistic. They can be put up with nail and hammer. Write for prices.

ATLAS MFG. CO.,
 New Haven, - - Conn.

Sectional cut showing construction of knob.

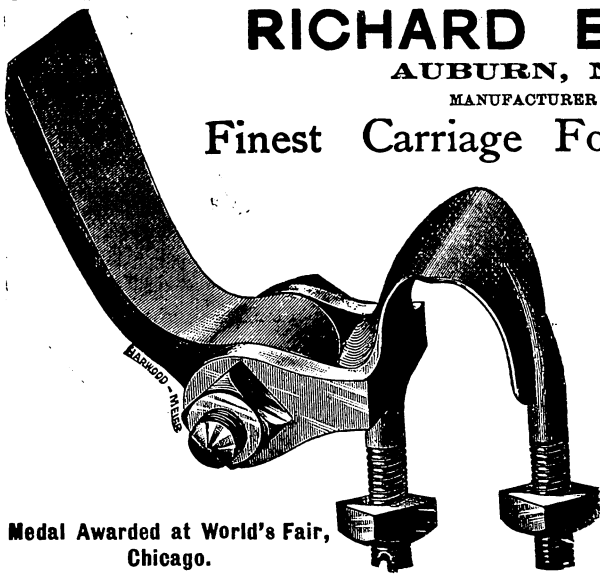


Half size cut of knob as applied to door. NO SIDE SCREWS OR ADJUSTING WASHERS.

The Whipple Patent Door Knob. Patented Nov. 7th, 1893, other Patents pending.Constructed on an entirely new principle neither expensive nor complicated. Secures perfect adjustment to doors with strength and durability. Use it and avoid the disagreeable end chace and general looseness of the ordinary knob. For Catalogue and Price-List address **THE PERRY & WHIPPLE CO.** New Haven, Ct.**RICHARD ECCLES,****AUBURN, N. Y.,**

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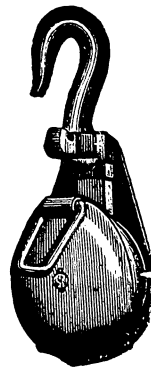
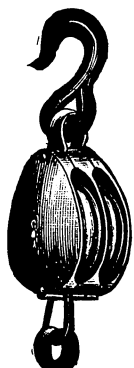
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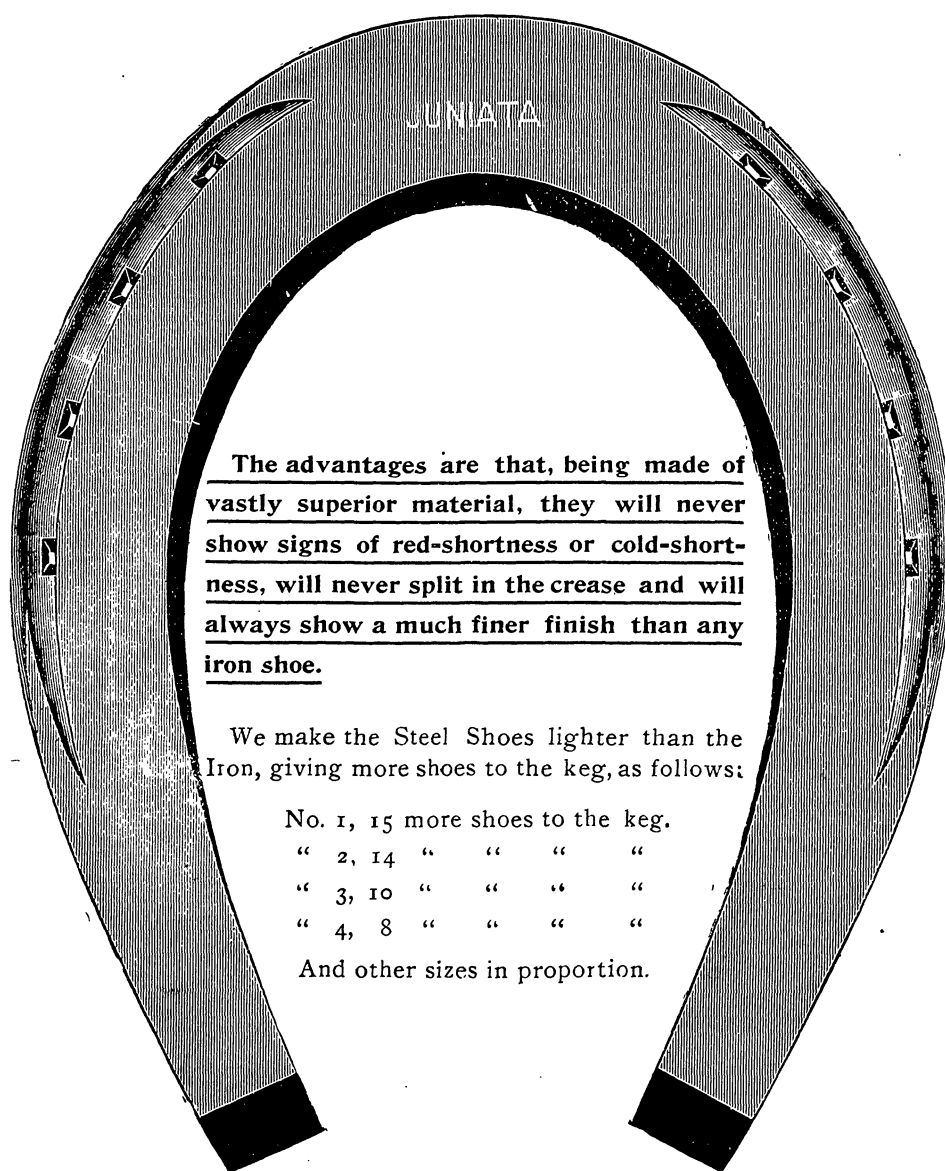
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" 2,	14 " " " "
" 3,	10 " " " "
" 4,	8 " " " "

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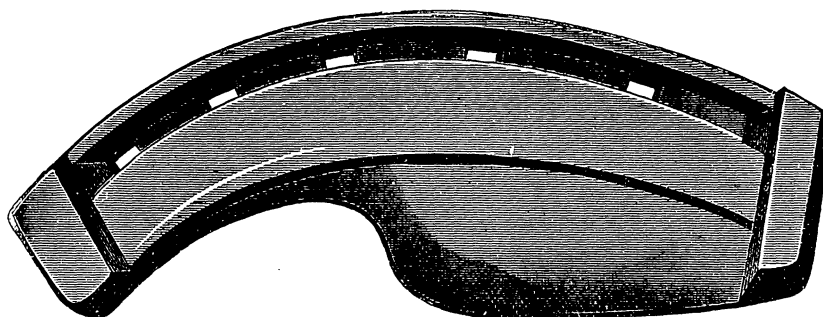
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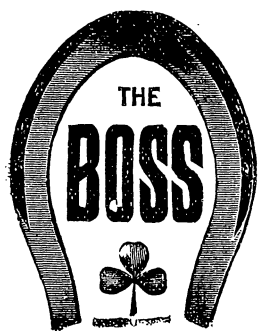
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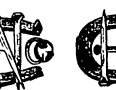



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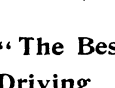





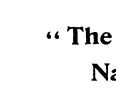
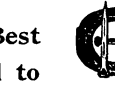

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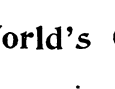
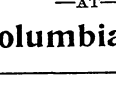





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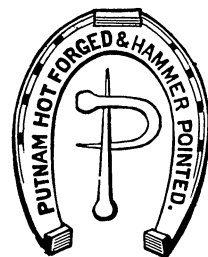
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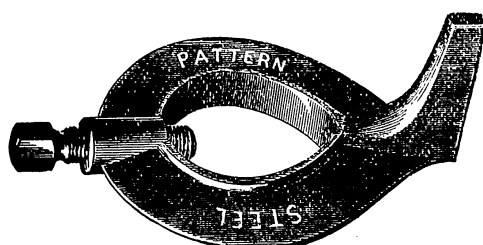
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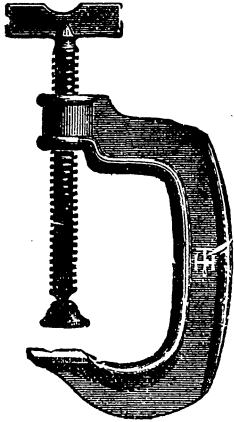
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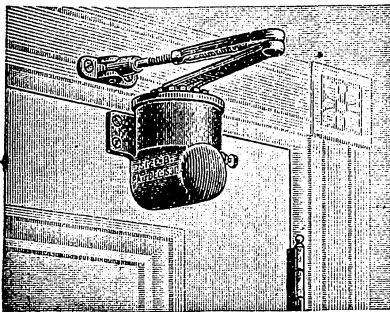
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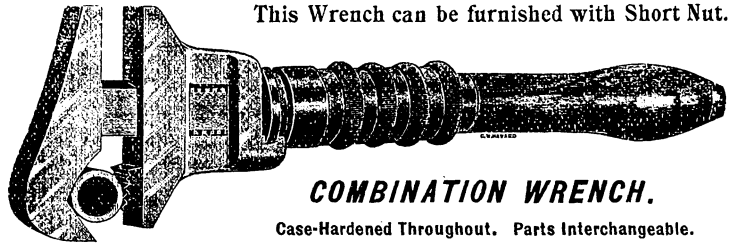
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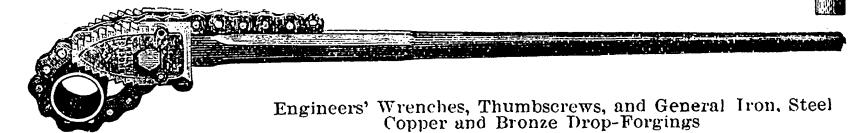
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Sliding bar gradu-
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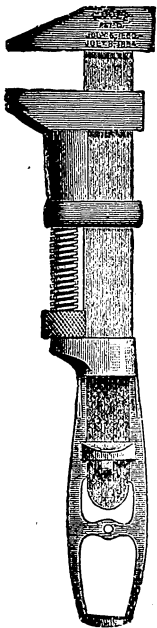
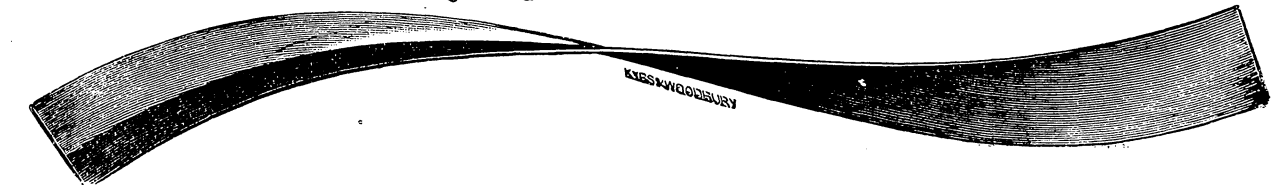
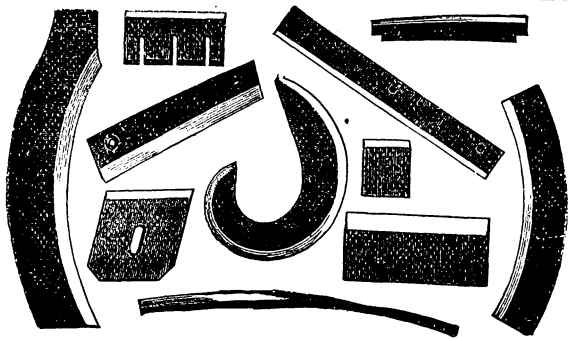
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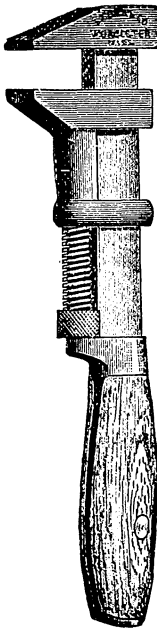
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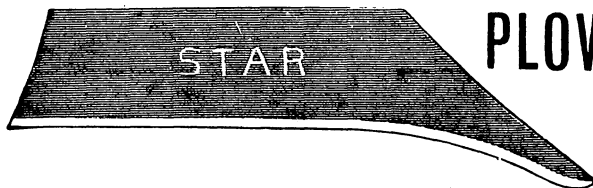
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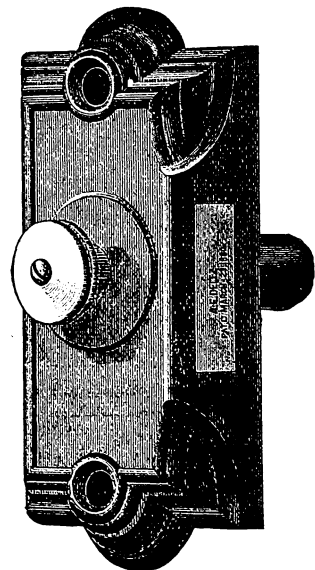
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BRASS HINGE
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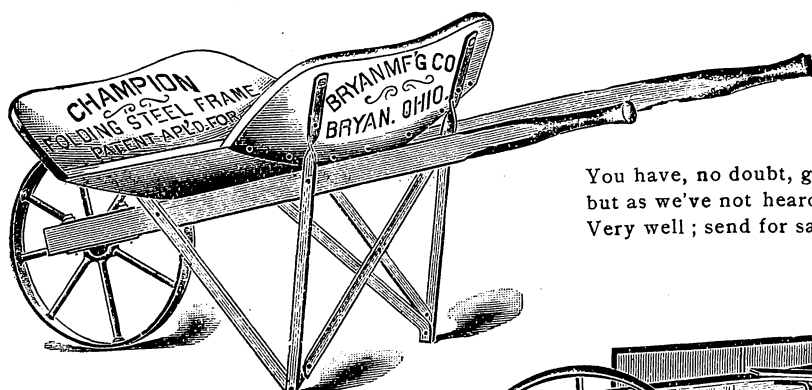
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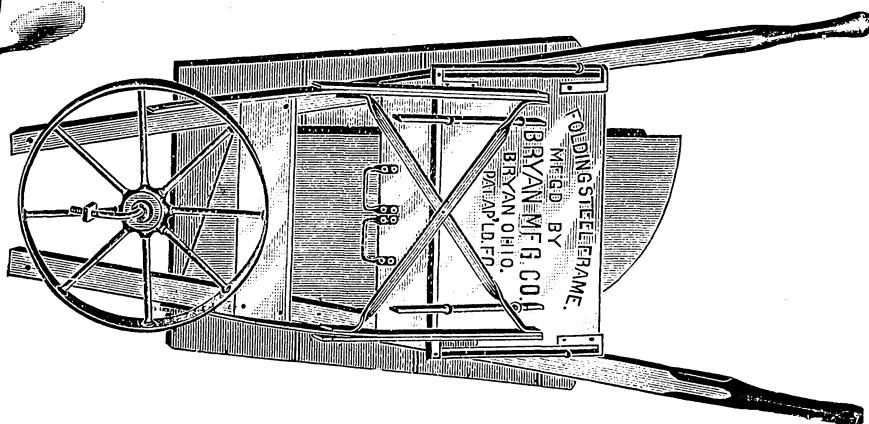


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You have, no doubt, given the “Champion” some consideration, but as we've not heard from you suppose you need convincing. Very well; send for sample, it'll tell the tale better than print.

HOW DO YOU LIKE ITS LOOKS?

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MANUFACTURED BY

AMERICAN STEEL SCRAPER CO.

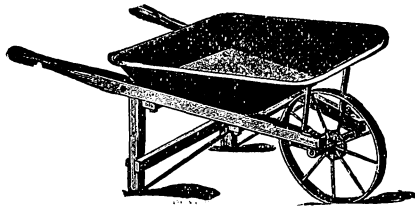
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for
Catalogue



STRANGE GOODS



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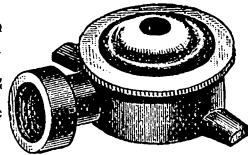
Sidney Steel Scraper Co., 924 Poplar Street, SIDNEY, OHIO.



Japanese No. 12, Adjust.

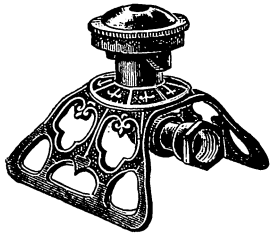
LAWN SPRINKLERS.

Cactus No. 8.



We manufacture the BEST and CHEAPEST Lawn Sprinklers in the World.

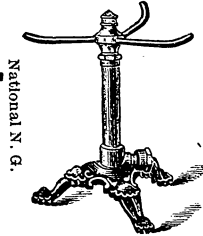
The only Sprinklers which have no revolving parts to leak or wear out.
The only Sprinklers free from small holes, and which cannot become clogged with gritty substances.
The only Sprinklers which are adjustable and will give a spray as fine as the mist of Niagara, or as heavy as the area of the supply pipe.
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LITTLE GIANT

Traveling Lawn Sprinkler.

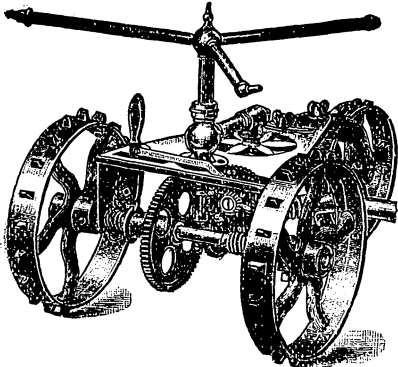
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Can be set to travel anywhere from 15 to 500 feet per hour, either on a straight line or in a circle, and can be gauged to throw water over a swath 5 to 50 feet in width.

Highest Award at World's Columbian Exhibition.

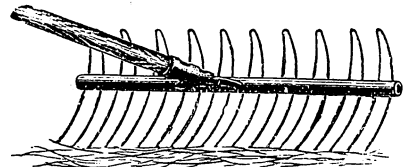
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PORTLAND LAWN SPRINKLER CO.,
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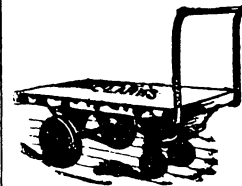
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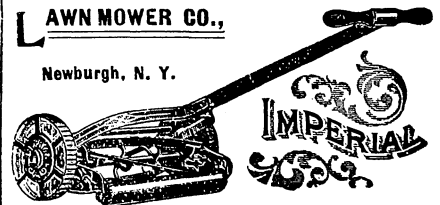
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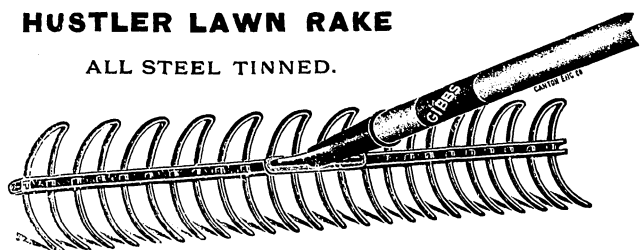
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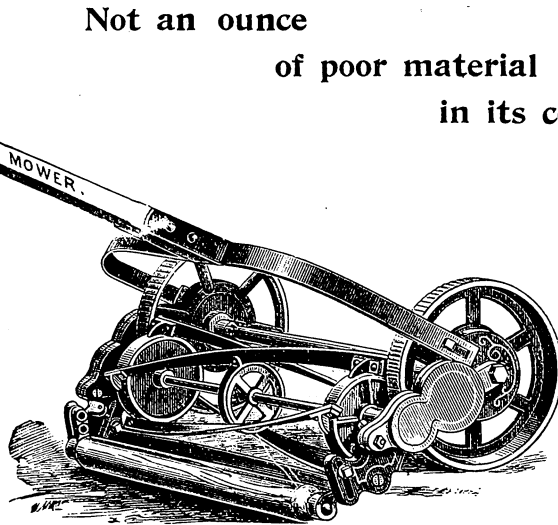
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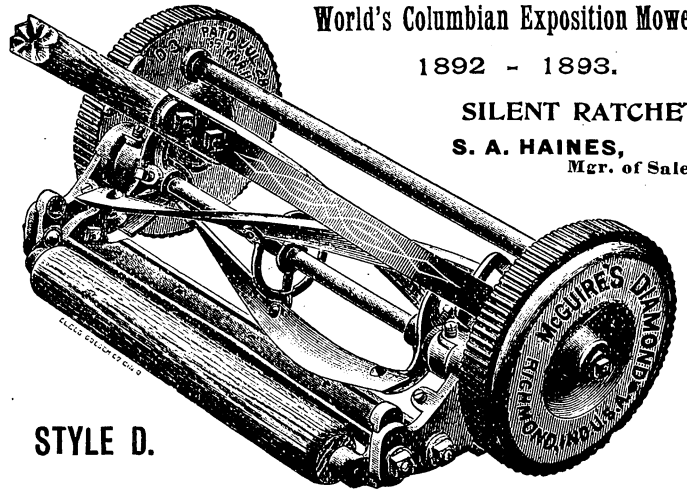
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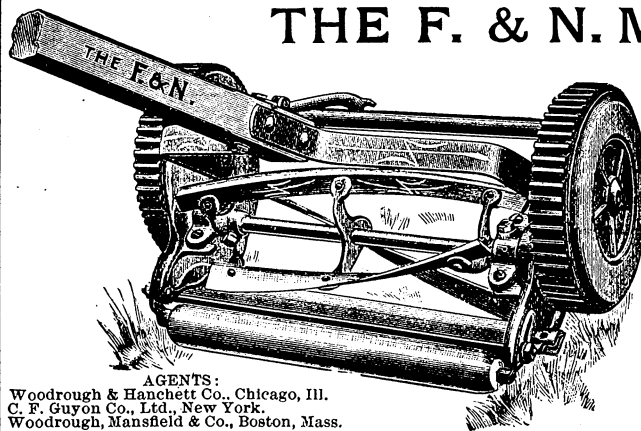
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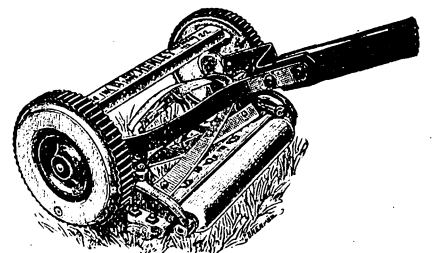
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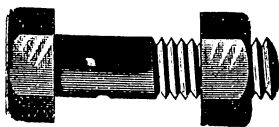
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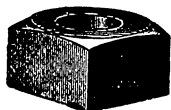
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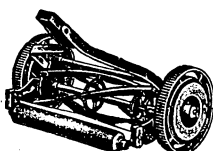
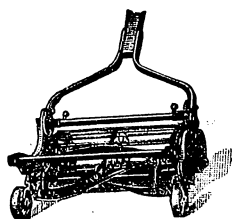
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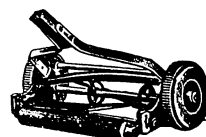
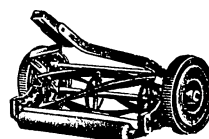


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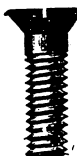
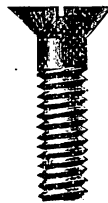
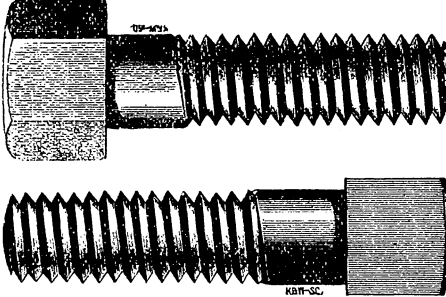
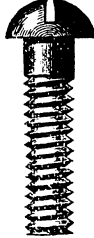
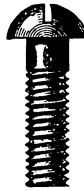


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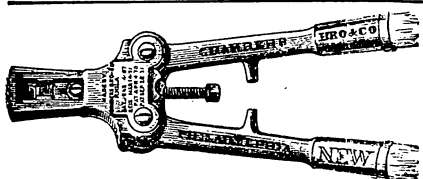
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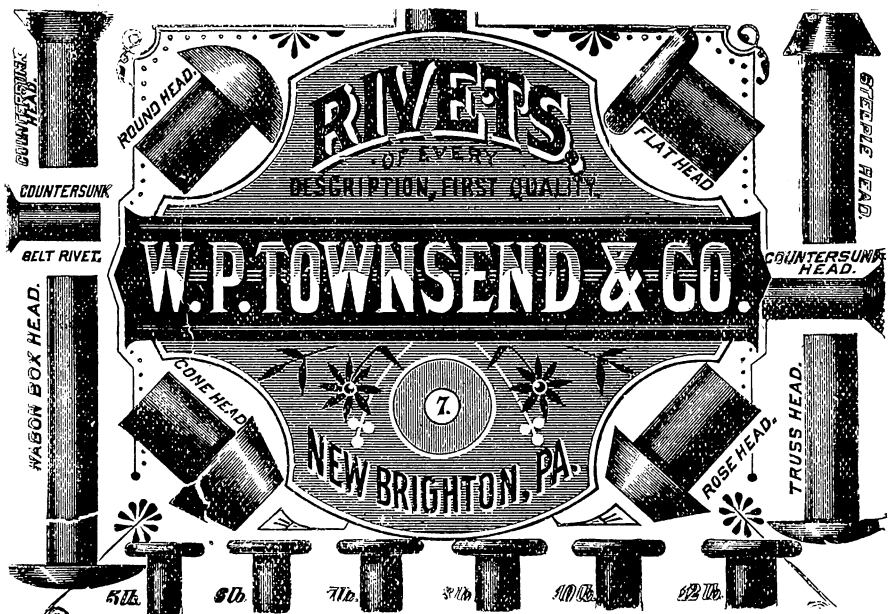
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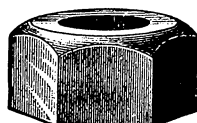
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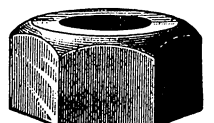


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Ruck Bros., Milbury, Mass.
Buck, Chas., Milbury, Mass.
White, L. & I. J. Co., Buffalo, N. Y.

Chucks.

Cushman Chuck Co., Hartford, Conn.
Hoggson & Pettis Mfg. Co., New Haven, Conn.
Smith & Egge Mfg. Co., Bridgeport, Conn.
Union Mfg. Co., 108 Chambers, N. Y.
Whitlock, Wm., 39 Cortlandt St., N. Y.
Whitton, D. E. Mach. Co., New London, Conn.

Clamps.

Hammer & Co., Branford, Conn.
Le Count, C. W., So. Norwalk, Conn.

Clipping Machines.

McCoy, Jos. F. & Co., 26 Warren St.

Coal.

Barns, C. K. & Co., Philadelphia, Pa.
Wister, Francis, Philadelphia, Pa.

Coke.

Barns, C. K. & Co., Philadelphia, Pa.
Houston, C. B. & Co., Philadelphia, Pa.
Rahney, W. J., Cleveland, O.
Wister, Francis, Philadelphia, Pa.

Collections.

Hardware Board of Trade (Limited) 4 and 6 Warren, N. Y.

Condensers.

Worthington, Henry R., 86 & 88 Liberty Street, N. Y.

Conveying Machinery.

Brown Holsting & Conveying Machine Co., Cleveland, Ohio.
Jeffrey Mfg. Co., Columbus, O.
Link Belt Engineering Co., Phila., Pa.

Copper.

Ames Sword Co., Chicopee, Mass.
Ansonia Brass & Copper Co., 19 and 21 Cliff, N. Y.
Hendricks Bros., 49 Cliff, N. Y.
New Haven Copper Co., 294 Pearl, N. Y.
Randolph & Clowes, Waterbury, Conn.
Rome Brass & Copper Co., Rome, N. Y.
Wiser, Francis, Philadelphia, Pa.

Cordage.

Samson Cordage Works, Boston, Mass.

Cork Screws.

Williamson, C. T. Wire Novelty Co., Newark, N. J.

Corrugated Furnaces.

Continental Iron Wks, Brooklyn, N. Y.

Corrugated Iron.

Cincinnati Corrugating Co., Piqua, O.
Cambridge Roofing Co., Cambridge, Mass.
Moseley Iron Bridge & Roof Co., 6 Dev & V.
N. Y. Iron Roofing & Corrugating Co., Jersey City, N. J.

Counting Machines.

Durant, W. N., Milwaukee, Wis.

Coverings, Boiler and Pipe.

Johns, H. W. Mfg. Co., 87 Maiden Lane.

Cranes.

Detroit Foundry Equipment Co., Detroit, Mich.
Halsey, W. S. & Co., Birdsboro, Pa.
Harrington, E. Son & Co., Phila., Pa.
Maris & Beekley, Philadelphia, Pa.
Ridgway, Craig & Sons, Coatesville, Pa.
Sellers, Wm. & Co., Inc., Phila., Pa.
Yale & Towne Mfg. Co., Stamford, Conn.

Credits.

Ealy, Jno. W. Co., 278-280 B'way, N. Y.

Cupolas, Hot-Blast.

Colliau, Victor, Detroit, Mich.
Detroit Fdry. Equipment Co., Detroit, Mich.

Curry Combs.

Gibbs Mfg. Co., Canton, O.

Cutlery Cases.

Torrey, J. R. & Co., Worcester, Mass.

Cutlery Enamel.

Shipley, A. B. & Son, Phila., Pa.

Cutlery, Importers of.

Field, Alfred & Co., 93 Chambers St., New York.
Gurney, Fred B., 116 Chambers St., N. Y.
Sickles, Sweet & Lyon, 35 Barclay, N. Y.

Cutlery, Manufacturers of.

Singham, W. Co., Cleveland, Ohio.
Dane, Stoddard & Kendall, Boston, Mass.
Goodell Co., Antrim, N. H.
Northampton Cutlery Co., Northampton, Mass.
Wilson, John, Sheffield, England.

Cyclometers.

Bridgeport Gun Implement Co., 313-315 Broadway, N. Y.

Dies.

Wilson, J. Fred, Worcester, Mass.

Die Forgings and Castings.

Bliss, E. W. Co., Brooklyn, N. Y.

Dog Collars.

Kelley & McBean, Niagara Falls, N. Y.

Door Checks and Springs.

Bardeley, J., 149 & 151 Baxter St., W. v. Corbin, P. & F., New Britain, Conn.

Door Knobs.

Perry & Whipple Co., New Haven, Ct.

Drain Cleaners.

Buckeye Mfg. Co., Union City, Ind.

Drilling Machines.

Blackford Drill & Tool Co., Cinnc., Ohio.
Buffalo Forge Co., Buffalo, N. Y.
Champion Blower and Forge Co., Lancaster, Pa.
Colburn, A. M., New Haven, Conn.
Dallett, Thos. H. & Co., Philadelphia.
Dwight Slate Machine Co., Hartford, Conn.
Goddard, Asa, Worcester, Mass.
Halsey, Jas. T., Philadelphia, Pa.
Hamilton Mch. Tool Co., Hamilton, O.
Norton & Jones Machine Tool Works, Plainville, Conn.
Penna. Diamond Drill & Mfg. Co., Birdsboro, Pa.
Quint, A. D., Hartford, Conn.
Sellers, Wm. & Co., Inc., Phila., Pa.
Sigsourney Tool Co., Hartford, Conn.
Silver Mfg. Co., Salem, O.

Drop Forgings.

Billings & Spencer Co., Hartford, Conn.
Boone, W. O. Mfg. Co., Boonton, N. J.
Eccles, Richard, Auburn, N. Y.
Merrill Bros., Brooklyn, N. Y.
Miner & Peck Mfg. Co., New Haven, Ct.
Phila. Drop Forge Co., Philadelphia, Pa.
Scranton Forging Co., Scranton, Pa.
Spies, J. C. & Co., Worcester, Mass.
Williams, J. H. & Co., Brooklyn, N. Y.
Willmot & Hobbs Mfg. Co., Bridgeport, Conn.
Wyman & Gordon, Worcester, Mass.

Drop Presses.

Bliss, E. W. Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Miner & Peck Mfg. Co., New Haven, Conn.
Stiles & Parker Press Co., Brooklyn, N. Y.
Vulcan Iron Works, Chicago, Ill.
Waterbury Farrel Foundry and Machine Co., Waterbury, Conn.

Dump Wagons.

Storm Mfg. Co., Newark, N. J.

Dust Beaters.

Peabody & Parks, Troy, N. Y.

Dynamite.

New York Powder Co., 62 Liberty St., N. Y.

Dynamos.

C. & C. Electric Co., 402 and 404 Greenwich St., N. Y.

Edge Tools, Makers of.

Ruck Irons, Milbury, Mass.
Buck, Chas., Milbury, Mass.
Cump, Fayette H., Philadelphia, Pa.
White, L. & I. J. Co., Buffalo, N. Y.

Edging Shears.

Dille & McGuire Mfg. Co., Richmond, Ind.

Egg Beaters.

North Bros. Mfg. Co., Philadelphia.

Electric Bells and Supplies.Osmander, W. A. & Co., 204 Fulton St., New York
Wollensak, J. F., Chicago, Ill.**Elevators, Makers of.**Link-Belt Engineering Co., Phila., Pa.
Morse, Williams & Co., Phila., Pa.**Emery and Emery Wheels.**N. Y. Belting & Packing Co., Ltd., N. Y.
Northampton Emery Wheel Co., Leeds, Mass.
Norton Emery Wheel Co., Worcester, Mass.
Sterling Emery Wheel Co., 174 Fulton St., New York.
Sturtevant Mill Co., Boston, Mass.**Emery Wheel Dressers.**

Bay State Stamping Co., Worcester, Mass.

Enamels.

Nubian Iron Enamel Co., Cragin, Ill.

Engineers and Contractors.Alken-Henry, Pittsburgh, Pa.
Artificial Gas Engineering Co., Pittsburgh, Pa.
Herrick, J. A., 284 Pearl St., N. Y.
Kennedy, Julian, Pittsburgh, Pa.
Laughlin, Alex. & Co., Pittsburgh, Pa.
Lean, D. R., Co., Pittsburgh, Pa.
McClure, Amster & Co., Pittsburgh, Pa.
Pittsburgh Iron & Steel Engineering Co., Pittsburgh, Pa.
Smayda, S. H. Co., Incorporated Pittsburgh, Pa.
Swindell, W. & Bros., Pittsburgh, Pa.**Engines, Gas.**Otto Gas Engine Works, Phila., Pa.
Rollason Gas Engine, Havemayer Bldg., N. Y.**Engines, Steam, Makers of.**Bass Foundry & Machine Works, Ft. Wayne, Ind.
Buckeye Engine Co., Salem, O.
Erie Engine Works, Erie, Pa.
Norwalk Iron Works Co., So. Norwalk, Conn.
Penns. Diamond Drill & Mfg. Co., Birdsboro, Pa.
Phila. Engineering Works, Phila., Pa.
Phoenix Iron Wks. Co., Meadville, Pa.
Southwick Foundry and Machine Co., Phila., Pa.
Tad, Will & Co., Youngstown, O.
Wetherill, Robt. & Co., Chester, Pa.**Exhaust Tumblers.**

Sweetser, W. A., Brockton, Mass.

Expansion Belts.Boone, W. O. Mfg. Co., Boonton, N. J.
Church, Isaac, Toledo, O.
Steward & Romaine Mfg. Co., Phila., Pa.**Faucets, Self-Measuring.**

Lane Bros., Poughkeepsie, N. Y.

Faucets, Wooden, Makers of.

John Sommer's Son, Newark, N. J.

Feed-Water Heaters.Davis, I. B. & Son, Hartford, Conn.
Goubert Mfg. Co., 82 Cortlandt St., N. Y.
Harrison Safety Boiler Wks., Phila., Pa.
National Pipe Bending Co., New Haven, Conn.
Taunton Locomotive Mfg. Co., Taunton, Mass.
Webster, Warren & Co., Camden, N. J.
Whitlock Coil Pipe Co., Elmwood, Conn.**Fence Ratchet.**

Stauffer J., Dayton, Ohio.

Forcing Iron and Wire.Barnum, E. T., Detroit, Mich.
Champion Iron Co., Kenton, O.
Clinton Wire Cloth Co., Clinton, Mass.
Gilbert & Bennett Mfg. Co., 42 Cliff St., Elmer Mfg. Co., Newburgh, N. Y.
Mast, Foss & Co., Springfield, O.
The Van Dorn Iron Works Co., Cleveland, O.**File Cards.**

Frasse Co., 19 Warren St., N. Y.

Files, Importers of.

Moss, F. W., 80 John, N. Y.

Files and Rasps, Manufacturers of.Arcade File Works, Anderson, Ind.
Banker & White, Troy, N. Y.
Barnett, G. & H., 41 & 43 Richmond Phila.
McCaffrey File Co., Philadelphia.
Nicholson File Co., Providence, R. I.**Fire Brick, Makers of.**Borgner, Cyrus, Philadelphia, Pa.
Gardner, Jas. & Son, Cumberland, Md.
Kreischer B. & Sons, Foot E. Houston, St.
McCleod & Henry Co., Troy, N. Y.
Maurer, H. & Son, 420 E. 23d, N. Y.
Ostrander Fire Brick Co., Troy, N. Y.
Solomon, Jno. M., Wilmington, Del.
Valentine, M. D. & Bro., Woodbridge.**Fishing Tackle.**

Dane, Stoddard & Kendall, Boston, Mass.

Flint.

Crystal Mills Co., Chester, Mass.

Flint and Emery Paper.

Baeder, Adamson & Co., Phila., Pa.

Flue Cleaners.

Mackey, Jas. T., St. Louis, Mo.

Fodder O

Silver Mfg. Co., Salem, O.

Forges, Portable, &c.Sullock Bellows Co., Cleveland, O.
Buffalo Forge Co., Buffalo, N. Y.
Champion Blower & Forge Co., Lancaster, Pa.
Sturtevant, B. F. Co., Boston, Mass.**Forgings, Iron and Steel.**Bethlehem Iron Co., S. Bethlehem, Pa.
Cambria Steel-Cambria Iron Co., Johnstown, Pa.
Frankford Steel Co., Phila., Pa.
Scranton Forging Co., Scranton, Pa.
U. S. Projectile Co., Brooklyn, N. Y.**Foundry Findings.**Dixon, Jos., Crucible Co., Jersey City, N. J.
s. Obermayer Co., Cincinnati, O.
Smith, J. D. Fdy. Supply Co., Cinn., O.
Solomon, Jno. M., Wilmington, Del.**Foundry Moulds.**

Estey, W. S. 65 Fulton, N. Y.

Foundry Supplies.Colliau, Victor, Detroit, Mich.
Diamond Clamp & Flask Co., Richmond, Ind.
s. Obermayer Co., Cincinnati, O.
Smith, J. D. Fdy. Supply Co., Cinn., O.**Friction Clutches.**Keystone Clutch & Mch. Wks., Phila., Pa.
Moore & White Co., Philadelphia, Pa.**Friction Cone.**

Evans Friction Cone Co., Boston, Mass.

Galvanizing Kettles.

Sands, Thos., Nashua, N. H.

Gas Producers.

Wood, R. D. & Co., Philadelphia, Pa.

Gas & Steam Fitters' Supplies.

Pancoast, Henry B. & Co., Phila., Pa.

Gauge, Rolling Mill.

Haines Gauge Co., Philadelphia, Pa.

Gear Cutters.

D. E. Whiton Mach. Co., New London, Conn.

Gears.Boston Gear Works Boston, Mass.
Gleason Tool Co., Rochester, N. Y.
Poole, Root & Son Co., Baltimore, Md.
U. S. Projectile Co., Brooklyn, N. Y.**Glass Cutters.**

Monroe, S. G., Bristol, Conn.

Glue.Baeder, Adamson & Co., Phila., Pa.
Dodd, A. W. & Co., Gloucester, Mass.
Gussia Cement Co., Gloucester, Mass.**Grass Catchers.**

Supplee Hardware Co., Phila., Pa.

Grinding and Polishing Machines.

Norton Emery Wheel Co., Worcester, Mass.

Grindstone Dressing Machinery.

Blake & Johnson, Waterbury, Conn.

Grindstones.

Cleveland Stone Co., Cleveland, O.

Gunpowder, Makers of.

Ladlin & Rand Powder Co., 29 Murray St., N. Y.

Hand Carts.

Lansing Wheelbarrow Co., Lansing, Mich.

Handles.

New York Mallet and Handle Wks., 456 E. Houston St., N. Y.

Handle Couplings.

Bourke Mfg. Co., Youngstown, O.

Hangers, Door.

Coburn Trolley Track Mfg. Co., Holyoke, Mass.

Lane Bros., Poughkeepsie, N. Y.**Victor Mfg. Co., Newburyport, Mass.****Hardware Comm'n Merchants.**Dochter, Martin, 88 Chambers, N. Y.
Field, Alfred & Co., 93 Chambers St., N. Y.**Graham, John H. & Co., 111 Chambers St., New York.****Jacobus, W. H., 90 Chambers, N. Y.****Hardware Manufacturers.**Stearns, E. C. & Co., Syracuse, N. Y.
Union Mfg. Co., 103 Chambers, N. Y.
Yale & Towne Mfg. Co., Stamford, Conn.**Hardware Mfrs. Agents.**Bingham, W. Co., Cleveland, O.
Clarke, Thomas, St. John, N. B.
Graham, John H. & Co., 113 Chambers, N. Y.
McCoy, Jos. F. Co., 28 Warren St., N. Y.
Sickles, Sweet & Lyon, 35 Barclay, N. Y.**Hardware Specialties.**Asme Shear Co., Bridgeport, Conn.
Berger Bros., Philadelphia, Pa.
Enterprise Mfg. Co., Philadelphia, Pa.
Ette & Henger Mfg. Co., St. Louis, Mo.
Haines & Zimmerman, Phila., Pa.
Johnson, S. C., Racine, Wis.
Knapp & Cowles Mfg. Co., Bridgeport, Conn.
New Britain Hdw. Mfg. Co., New Britain, Conn.
North Bros. Mfg. Co., Philadelphia, Pa.
Peabody & Parks, Troy, N. Y.
Scranton & Co., New Haven, Conn.
Shepard, Sidney & Co., Buffalo, N. Y.
Wilson, J. Fred, Worcester, Mass.**Harness Snaps.**Covert Mfg. Co., West Troy, N. Y.
Coverts' Saddlery Wks., Farmer, N. Y.
Fitch, W. & E. T., New Haven, Conn.**Hoisting Machines.**Jox, Alfred & Co., 314 Green, Phila.
Brown Hoisting & Conveying Mch. Co., Cleveland, Ohio.**Fulton Iron & Engine Wks., Detroit, Mich.**Harrington, E. Son & Co., Phila.
Lane Bros., Poughkeepsie, N. Y.
Lidgerwood Mfg. Co., 86 Liberty, N. Y.
Maris & Beekley, Philadelphia.**Moore Mfg. & Fdy. Co., Milwaukee, Wis.**Moen Williams & Co., Phila.
Sellers, Wm. & Co., Phila. and N. Y.
Spidel, J. G., Reading, Pa.**Yale & Towne Mfg. Co., Stamford, Ct.****Hollow Ware.**Bronson Supply Co., Cleveland, Ohio.
Cleveland Stamping & Tool Co., Cleveland, O.**Hollow Ware, Aluminum.**

Illinois Pure Aluminum Co., Lemont, Ill.

Horse Nails, Makers of.Capewell Horse Nail Co., Hartford, Conn.
National Horse Nail Co., Vergennes, Vt.
Ruman Nail Co., Neponset, Boston, Mass.**Horse and Mule Shoes, Makers of.**Aryden Horse Shoe Co., Catsanqua, Pa.
Burden Iron Co., Troy, N. Y.
Crescent Horse Shoe & Iron Co., Max Meadows, Va.**Diamond State Iron Co., Wilmington, Del.**Old Dominion Iron & Nail Works Co., Richmond, Va.
Phoenix Horse Shoe Co., Poughkeepsie, N. Y.**Rhode Island Perkins Horse Shoe Co., Providence.**Shoenberger & Co., Pittsburgh, Pa.
Standard Horse Shoe Co., Boston, Mass.**Hose.**

N. Y. Belting & Packing Co., Ltd., 15 Park Row, N. Y.

Hydrants, &c.

McLean, John, 296 & 298 Monroe, N. Y.

Hydraulic Forging.

U. S. Projectile Co., Brooklyn, N. Y.

Hydraulic Jacks.Dudgeon, Richard, 24 Columbia, N. Y.
Watson & Stillman, 204 E. 43d, N. Y.**Ice Breakers.**

Clement & Dunbar, Philadelphia, Pa.

Ice-Cream Freezers.Clement & Dunbar, Phila., Pa.
North Bros. Mfg. Co., Phila., Pa.
Packer, C. W., Philadelphia, Pa.
White Mountain Freezer Co., Nashua, N. H.**Injectors.**Eynon-Evans Mfg. Co., Philadelphia, Pa.
Jenkins Bros., New York**Insurance, Boiler.**

Hartford Steam Boiler Inspection & Insurance Co., Hartford, Conn.

Iron and Steel, Swedish.Lundberg, Gustaf, Boston, Mass.
Milne, A. & Co., 1 Broadway, N. Y.**Iron Commission Brokers.**Corning, Edw. & Co., 29 B'way, N. Y.
Cotton, Barclay W. & Co., Phila.
Etting, Edw. J., Philadelphia.**Hogan, John L. & Co., Philadelphia, Pa.**Hoffman, J. W. & Co., Philadelphia.
Levis, Henry & Co., Philadelphia.
Keeley, Jerome & Co., Philadelphia.**Lea, J. Tattall & Co., Philadelphia.**Mohr, J. J., 480 Walnut, Philadelphia.
Filling & Crane, Philadelphia, Pa.
Wister, L. & R. Co., Phila., Pa.**Iron Ore.**Naylor & Co., 45 Wall, N. Y.
Samuel, Frank, Philadelphia, Pa.**Iron, Merchants.**Barnes, C. K. & Co., Philadelphia, Pa.
Borden & Lovell, 70 West, N. Y.
Bussentius & Cunliffe, Philadelphia.**Corning Edw. & Co., 29 B'way, N. Y.**Cox, Justice, Jr., Philadelphia.
Cotton, Barclay W. & Co., Phila.
Hoffman, J. W. & Co., Philadelphia.**Leonard, J., 448 West St., N. Y.**Navlor & Co., 45 Wall St., N. Y.
Nicolls, Wheeler & Co., Philadelphia.
Ogden & Wallace, 85 Elm St., N. Y.**Piercen & Co., 29 Broadway, N. Y.**Thomson, W. H. & Co., Phila., Pa.
Wallace, Wm. H. & Co., Albany, N. Y.
Washington streets, N. Y.**Whitney, A. R. & Co., 17 B'way, N. Y.**

Wilson, E. H. & Co., Philadelphia.

Iron, Importers.Abbott Wheelock & Co., N. Y. and Boston.
Lundberg, Gustaf, Boston, Mass.**Iron, Sheet, Manufacturers of.**Cambridge Iron & Steel Co., Cambridge, Ohio.
W. Dewees Wood Co., Lim., McKeesport, Pa.**Iron Vases.**

Walbridge & Co., Buffalo, N. Y.

Ironwork, Ornamental.Barnum, E. T., Detroit, Mich.
Champion Iron Co., Kenton, O.
Ludlow-Saylor Wire Co., St. Louis, Mo.
Mast, Foss & Co., Springfield, O.
The Van Dorn Iron Works Co., Cleveland, O.**Keys.**

Wollensak, J. F., Chicago, Ill.

Ladders, Rolling.

Coburn Trolley Track Mfg. Co., Holyoke, Mass.

Ladies.

Detroit Fdy. Equipment Co., Detroit, Mich.

Lamps.

Plume & Atwood Mfg. Co., New York.

Lamp Stoves.Glazier Stove Co., Chelsea, Mich.
Plume & Atwood Mfg. Co., 18 Murray Street, New York.**Lanterns.**

Steam Gauge & Lantern Co., Syracuse, N. Y.

Lathes.Draper Machine Tool Co., Worcester, Mass.
Johnson, Israel H., Jr., & Co., Philadelphia, Pa.**Seneca Falls Mfg. Co., Seneca Falls, N. Y.****Lathing, Wire.**Clinton Wire Cloth Co., Clinton, Mass.
N. J. Wire Cloth Co., Trenton, N. J.
Wright & Colton Wire Cloth Co., Worcester, Mass.**Laundry Machines.**

Johnson, S. C., Racine, Wis.

Lawn Mowers.Blair Mfg. Co., Springfield, Mass.
Chadborn & Coldwell Mfg. Co., Newburgh, N. Y.
Coldwell Lawn Mower Co., Newburgh, N. Y.**Dille & McGuire Mfg. Co., Richmond, Ind.**Enterprise Mfg. Co., Philadelphia, Pa.
F. & N. Mfg. Co., Richmond, Ind.
Henley, M. C., Richmond, Ind.**Mast, Foss & Co., Springfield, O.**Philadelphia Lawn Mower Co., Philadelphia, Pa.
Stearns, E. C. & Co., Syracuse, N. Y.
Supplee Hdw. Co., Phila., Pa.**Lawn Rakes.**Gibbs Mfg. Co., Canton, Ohio.
Konier, F. E. & Co., Canton, O.**Lawn Sprinklers.**Ette & Henger Mfg. Co., St. Louis.
Gibbs Mfg. Co., Canton, Ohio.
McGowan, John H. Co., Cincinnati, O.**Portland Lawn Sprinkler Co., Portland, Me.****Lemon Squeezers.**

Ripley Mfg. Co., Unionville, Conn.

Letters and Figures, Metallic.

White, A. A. & Co., Providence, R. I.

Letters, Paper.

Tablet & Ticket Co., Chicago, Ill.

Levels.

Richardson, O. F., & Son Athol, Mass.

Locks & Knobs, Manufacturers of.Deltz, A. E., 97 Chambers, N. Y.
Reading Hdw. Co., Reading, Pa.
Smith & Egge Mfg. Co., Bridgeport, Conn.**Yale & Towne Mfg. Co., Stamford, Conn.****Lubricants.**

Dixon, Jos., Crucible Co., Jersey City, N. J.

Machinery.Am. Tool Works, Cleveland, Ohio.
Barnes, W. F. & John, Rockford, Ill.
Sement, Miles & Co., Philadelphia, Pa.**Bigelow, C. E., 46 Dey, N. Y.**Birnall & Keeler Mfg. Co., St. Louis.
Birmingham Iron Foundry, Birmingham, Conn.**Bliss, E. W. Co., Brooklyn, N. Y.**Bozert, Jno. L., Flushing, N. Y.
Bridgeport Mch. Tool Works, Bridgeport, Conn.**Biggs, Marvin, 12 Broadway, N. Y.**Carlin's Sons, Thos., Allegheny, Pa.
Cinn. Milling Mch. Co., Cincinnati, Ohio.**Clapp, Geo. M., agt., 74 Cortlandt, N. Y.**Detrick & Harvey Mch. Co., Baltimore, Md.
Fitchburg Mch. Works, Fitchburg, Mass.**Garvin Mch. Co., Lait & Canal Sts.**Gould & Eberhardt, Newark, N. J.
Hamilton Mch. Tool Co., Hamilton, O.
Harrington, E. Son & Co., Phila., Pa.**Henderer, A. L., Wilmington, Del.**Henger Machine Co., Torrington, Ct.
Gth. Clark & Co., Boston, Mass.**Howard & Morse, 45 Fulton St., N. Y.**

Hulbut-Rogers Mch. Co., South Sudbury, Mass.

- Place, Geo.,** 120 Broadway, N. Y.
Poole, Robt. & Son Co., Baltimore, Md.
Post & Whitney Co., Worcester, Mass.
Prentiss Tool & Supply Co., N. Y.
Scranton Supply & Mch. Co., Scranton, Pa.
Sellers, Wm. & Co., Phila.
Seyfer's Sons L. F., Philadelphia, Pa.
Stephens, J. & Co., Cincinnati, O.
Stow Flexible Shaft Co., Phila.
Toomer, Frank, Philadelphia, Pa.
Wetherill, Robert & Co., Chester, Pa.
Wickes Bros., Saginaw, Mich.
Wilson, W. A., Rochester, N. Y.
- Machinery for Hardware Manufacture.**
Adt, Jno. & Son, New Haven, Conn.
- Machine Knives.**
Loring Coes & Co., Worcester, Mass.
- Machine Screws.**
New Britain Hdw. Mfg. Co., New Britain, Conn.
- Machine Tools.—See Machinery.**
- Machine Work.**
Papping, J., 56th St., & 11th Ave., N. Y. City.
- Machinists' Scales.**
Coffin & Leighton, Syracuse, N. Y.
Starrett, L. S., Athol, Mass.
Valentine Tool Co., Hartford, Conn.
- Machinists' Tools and Supplies.**
King, J. M. & Co., Waterford, N. Y.
Sellers, Wm. & Co., Inc., Phila.
- Mallets.**
N. Y. Mallet & Handle Works, N. Y.
- Mangles.**
Johnson, S. C., Racine, Wis.
- Measuring Tapes.**
Keuffel & Esser Co., New York.
Lufkin Rule Co., Saginaw, Mich.
- Mechanical Instruction.**
Correspondence School of Mechanics
Scranton, Pa.
- Metals.**
Fearing, Wm. S., 100 Chambers, N. Y.
Hendricks Bros., 49 Cliff, N. Y.
Naylor & Co., 45 Wall, N. Y.
- Metal Brokers.**
American Metal Co., N. Y.
- Metallurgists.**
Britton, J. Blodgett, Phila., Pa.
- Milk Can Trimmings.**
Shepard, Sidney & Co., Buffalo, N. Y.
- Milling Machines.**
Cin. Milling Mch. Co., Cincinnati, Ohio.
- Mining Knives.**
Palmer Hdw. Mfg. Co., Troy, N. Y.
- Mine Lamps.**
Darby, Edw. & Sons Phila. Pa.
Leonard, B. E., Scranton, Pa.
- Mining Screens.**
Harrington & King Perforating Co
Chicago, Ill.
Howard & Morse, 45 Fulton, N. Y.
- Models, Makers of**
Franklin, H. H. Mfg. Co., Syracuse, N. Y.
Ideal Machine Works, Hartford, Conn.
Rhodes, L. E. Co., Hartford, Conn.
- Molding Sand.**
Obermayer, S. Co., Cincinnati, O.
- Motors, Water and Electric.**
O. & C. Electric Co., 402 and 404
Greenwich St., N. Y.
Dallett, Thos. H. & Co., Phila., Pa.
- Nail Machinery.**
Pittsburgh Mfg. Co., Pittsburgh, Pa.
- Nail Pullers.**
Scranton & Co., New Haven, Conn.
- Nails (Cut) and Spikes.**
Borden & Lovell, 70 West, N. Y.
Cumberland Nail & Iron Co., Phila.
Oxford Iron Co., 81 Washington.
Pottstown Iron Co., Pottstown, Pa.
Riverside Iron Wks., Wheeling, W. Va.
- Norway Shapes, Rollers of.**
Rowland, William & Harvey, Frank-
ford, Philadelphia
- Novelty Manufacturers.**
Franklin, H. H. Mfg., Syracuse, N. Y.
Ideal Machine Works, Hartford, Conn.
- Nut Machines.**
Onham Nut Mch. Co., Unionville, Ct.
- Nuts, Bolts, &c., Makers of.**
American Bolt Co., Lowell, Mass.
American Screw Co., Providence, R. I.
Blake & Johnson, Waterbury, Conn.
Haskell, Wm. H. Co., Pawtucket, R. I.
Mt. Carmel Bolt Co., Mt. Carmel, Conn.
Pennsylvania Bolt & Nut Co., Lebanon, Pa.
Port Chester Bolt and Nut Co., Port
Chester, N. Y.
Russell, Burdall & Ward, Port Chester
Sternbergh, J. H. & Son, Reading, Pa.
Wilson, J. Fred., Worcester, Mass.
Wm. H. Haskell Co., Pawtucket, R. I.
- Oilers.**
Wilmot & Hobbs Mfg. Co., Bridgeport,
Conn.
- Oil Stones.**
Pike Mfg. Co., Pike Station, N. H.
- Oil Stoves.**
Glazier Stove Co., Chelsea, Mich.
- Ores.**
Water, Francis, Philadelphia, Pa.
- Ox Shoes.**
Scranton Forging Co., Scranton, Pa.
- Packing.**
Morrison, Robt., St. Louis, Mo.
N. Y. Belting & Packing Co. Ltd., N. Y.
- Padlocks.**
Ames Sword Co., Chicopee, Mass.
Pratt, E. T., Lancaster, Pa.
Killebrand & Wolf, Phila., Pa.
- Paint Burners.**
Dangler Stove & Mfg. Co., Cleveland, O.
- Paint Cans.**
Wilmot & Hobbs Mfg. Co., Bridgeport,
Conn.
- Pants Stretcher.**
Covert Mfg. Co., West Troy, N. Y.
- Patent Solicitors.**
Butler, C. N., Phila., Pa.
Johnson & Johnson, Phila. & Wash'ton
Jenner, H. W. T., Washington, D. C.
Stocking, E. B., Washington, D. C.
- Perforated Metal.**
Clinton Wire Cloth Co., Clinton, Mass.
Harrington & King Perforating Co.
Chicago, Ill.
Hendrick Mfg. Co., Ltd., Carbondale,
Pa.
- Phosphor Bronze.**
Phosphor Bronze Smelting Co., Lim-
ited, Philadelphia.
- Phosphor Tin.**
Crescent Phosphorised Metal Co.,
Philadelphia, Pa.
Halk & Naumann, 516 Pearl, N. Y.
- Picks and Mattocks.**
Fumo, Fayette R., Philadelphia, Pa.
- Pig Iron.**
Johnson, C. B. & Co., Philadelphia, Pa.
Montour Iron & Steel Co., Danville, Pa.
Stear & Co., 45 Wall, N. Y.
Pilling & Crane, Philadelphia, Pa.
Samuel, Frank, Philadelphia, Pa.
- Pig Iron Storage.**
Am. Pig Iron Storage Warrant Co., 44
Wall, N. Y.
- Pile Drivers.**
Vulcan Iron Wks., Chicago, Ill.
- Pipe Bent.**
National Pipe Bending Co., New Haven
- Pipe Cutting and Threading Ma-
 chines.**
Bignall & Keeler Mfg. Co., St. Louis, Mo.
Merrill Mfg. Co., Toledo, O.
Pascoast Henry B. & Co., Philadelphia.
Saunders' Sons, D., Yonkers, N. Y.
Walworth Mfg. Co., Boston, Mass.
- Pipe Grips.**
Prentiss Vise Co., 44 Barclay, N. Y.
- Pipes, Fittings, &c., Makers of.**
McNab & Harlin Mfg. Co., N. Y.
- Pipe, Water and Gas, Makers of.**
Jumberland Nail & Iron Co., Phila. Pa.
Riverside Iron Works, Wheeling, W
Va.
Wood, R. D. & Co., Philadelphia, Pa.
- Plane Irons, Manufacturers of.**
Cook Bros., Millbury, Mass.
Buck, Chas., Millbury, Mass.
- Planes, Manufacturers of.**
Stanley Rule & Level Co., N. Y.
- Plated Ware.**
Boardman, L. & Son, New Baddam Ct'
Holmes & Edwards Silver Co., Bridge
port, Conn.
Rogers, Wm. Mfg. Co., Hartford, Ct.
- Plate, Iron and Steel, Mfrs of**
Etna-Standard Iron & Steel Co.,
Bridgeport, O.
Lukens Iron & Steel Co., Coatesville, Pa.
Mahoning Valley Iron Co., Youngs-
town, Ohio.
Moorhead-McLean Co., Pittsburgh, Pa.
McIlvain & Sons, Reading, Pa.
Pottstown Iron Co., Pottstown, Pa.
Pottsville Iron & Steel Co., Pottsville,
Pa.
Singer, Nimick & Co., Pittsburgh, Pa.
The Mahoning Valley Iron Co., Youngs-
town, O.
Wellman Iron & Steel Co., Thurlow, Pa.
Wood Alan Co., Philadelphia.
- Plating, Nickel, Brass and
 Silver.**
Wilmot & Hobbs Mfg. Co., Bridgeport,
Conn.
- Plow Shares.**
Star Mfg. Co., Carpentersville, Ill.
- Pokes.**
Bishop, A. W., Berea, Ohio.
- Polishing Machines.**
Watson & Stillman, 204 E. 43d, N. Y.
- Post Hole Diggers.**
Buckeye Mfg. Co., Union City, Ind.
Gibbs Mfg. Co., Canton, Ohio.
Gram, Jno. H. & Co., 113 Chambers
St., N. Y.
Water, L. & R. & Co., Philadelphia, Pa.
- Poultry Nettings.**
Barnum, E. T., Detroit, Mich.
Gilbert & Bennett Mfg. Co., 42 Cliff
St., N. Y.
N. J. Wire Cloth Co., Trenton, N. J.
"Silver Finish,"
Tyler Wire Wks. Co., W. S., Cleveland,
Ohio.
Wright & Colton Wire Cloth Co.,
Worcester, Mass.
- Powder.**
Lafin & Rand Powder Co., 29 Murray
New York Powder Co., 62 Liberty St.,
N. Y.
- Power Hack Saws.**
Millers Falls Co., 93 Reade St., N. Y.
- Power Hammers.**
Oienet & Eisenhardt, Philadelphia.
Dupont Mfg. Co., St. Johnsbury, Vt.
Jenkins & Lingie, Bellefonte, Pa.
Long & Allstatter Co., Hamilton, Ohio
Scranton & Co., New Haven, Conn.
- Presses, Dies, &c.**
E. W. Bins Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Stark Mch. & Tool Co., Buffalo, N. Y.
Stiles & Parker Press Co., Brooklyn,
N. Y.
Waterbury Mch. Co., Waterbury, Conn.
- Presses, Power, Makers of.**
Bliss, E. W. Co., Brooklyn, N. Y.
Hanville, E. J. Mch. Co., Waterbury, Ct.
Merriman, A. H., Meriden.
Stark Mch. & Tool Co., Buffalo, N. Y.
**Waterbury Farrel Foundry and Ma-
 chine Co.,** Waterbury, Conn.
- Pruners.**
Toplift & Ely Co., Elyria, Ohio.
- Pulleys.**
Keystone Clutch Mch. Wks., Phila.,
Pa.
Lake, J. H. & D. Co., Massillon, Ohio.
- Pumping Machinery.**
**Dean Bros. Steam Pump Works, In-
 dianapolis, Ind.**
Hooker-Colville Steam Pump Co., St.,
Louis, Mo.
Macowan, J. H. & Co., Cincinnati, O.
Martin, J. & Son, Jersey City, N. J.
Norwalk Iron Wks. Co., So. Norwalk,
Conn.
Southwark Fdy. & Mch. Co., Phila., Pa.
Valley Pump Wks., Easthampton, Mass.
Worthington, Henry R., 86 & 88 Liberty
St., N. Y.
- Pumps, Makers of.**
Bellevue Pump Co., Bellevue, Iowa.
Denning Co., Salem, O.
Douglas, W. & B., Middletown, Conn.
East, Foss & Co., Springfield, O.
Myers, F. E. & Bro., Ashland, O.
- Punches and Shears, Hand and
 Power.**
E. W. Bliss Co., Brooklyn, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Cross & Speirs Machine Co., Water-
bury, Conn.
Hender, A. L., Wilmington, Del.
Long & Allstatter Co., Hamilton, Ohio.
Stark Mch. & Tool Co., Buffalo, N. Y.
Stiles & Parker Press Co., Brooklyn,
N. Y.
**Waterbury Farrel Foundry and Mch.
 Co.,** Waterbury, Conn.
Watson & Stillman, 204 E. 43d, N. Y.
- Rails, Old and New.**
Perry, W. H. & Co., Providence, R. I.
- Rat and Mouse Traps.**
Estey, W. S., 65 Fulton, N. Y.
Ripley Mfg. Co., Unionville, Conn.
- Razors.**
J. R. Torrey Razor Co., Worcester,
Mass.
- Reels.**
Hendryx, A. B. Co., New Haven, Conn.
- Refrigerator Door Fasteners.**
Conroy, P. J. & Co., Philadelphia.
- Refrigerators.**
Challenge Corn Planter Co., Grand
Haven, Mich.
- Rivets.**
Blake & Johnson, Waterbury, Conn.
Boyce Rivet Co., Muncie, Ind.
Burden Iron Co., Tr. N. Y.
Clark & Cowles, Plainville, Conn.
Cobb & Drew, Plymouth, Mass.
Sternbergh, J. B. & Son, Reading, Pa.
Townsend, W. P. & Co., New Brighton,
Pa.
- Riveting Machines.**
Adt, Jno. & Sons, New Haven, Conn.
- Rock Drills.**
Band Drill Co., 23 Park Place, N. Y.
- Rolling Mill Machinery**
Birmingham Iron Fdry, Birmingham
Conn.
Booth, The Lloyd Co., Youngstown, O.
Leachburg Foundry & Mch. Co., Pitts-
burgh, Pa.
Morgan Construction Co., Worcester,
Mass.
Robinson-Rea Mfg. Co., Pittsburgh.
Totten & Hogg Iron and Steel Fdry Co.
Pittsburgh, Pa.
Trotterway Mfg. Co., Pittsburgh, Pa.
Waterbury Farrel Foundry & Mch
Co., Waterbury, Conn.
- Roll Lathes.**
Totten & Hogg Iron & Steel Fdry Co
Pittsburgh, Pa.
- Rolls, Chilled, Sand and Steel.**
Booth, The Lloyd Co., Youngstown, O.
Garrison, A. Fdry Co., Pittsburgh, Pa.
Robinson-Rea Mfg. Co., Pittsburgh, Pa.
Seaman, Sleeth & Black, Pittsburgh.
Totten & Hogg Iron and Steel Fdry Co.,
Pittsburgh, Pa.
- Roofing.**
Cambridge Roofing Co., Cambridge, O.
Cincinnati Corrugating Co., Fiqua, O.
Johns, H. W. Mfg. Co., 87 Maiden Lane
Kanneberg Roofing Co., Canton, O.
N. Y. Iron Roofing & Corrugating Co.,
Jersey City, N. J.
- Rope and Web Goods.**
Covert Mfg. Co., West Troy, N. Y.
Covert's Saddlery Wks., Farmer, N. Y.
- Rope Wheels.**
Cresson, Geo. V. Co., Philadelphia, Pa.
- Rubber Goods.**
Canfield, H. O., Bridgeport, Conn.
- Rules, Manufacturers of.**
Keuffel & Esser Co., New York.
Lufkin Rule Co., Saginaw, Mich.
Stanley Rule & Level Co., 29 Chambers,
N. Y.
- Rust Preventive.**
Bridgeport Gun Implement Co., 513-
515 Broadway, N. Y.
- Sand Paper.**
Baeder, Adamson & Co., Phila., Pa.
- Sash Balances.**
Callwell Mfg. Co., Rochester, N. Y.
Fulman Sash Balance Co., Rochester,
N. Y.
Vanderbilt Sash Balance Co., Canan-
daigua, N. Y.
- Sash Cords and Chains.**
Morton, Thos., 65 Elizabeth, N. Y.
Ossawan Mills Co., Norwich, Conn.
Samson Cordage Works, Boston, Mass.
Smith & Egge, Mfg. Co., Bridgeport.
- Sash Locks.**
Ives, H. B. & Co., New Haven, Conn.
- Sash Pulleys.**
Palmer Hardware Mfg. Co., Troy, N. Y.
- Sash Weights.**
Brown, E. E. & Co., Philadelphia, Pa.
- Saw Filing Machines.**
Disston, Henry & Sons, Philadelphia,
Pa.
- Saws, Makers of.**
Disston, Henry & Sons, Phila., Pa.
Disston, Henry & Sons, 86 Reade St., N. Y.
Simonds Mfg. Co., Fitchburg, Mass.
- Saw Vises.**
Seneca Falls Mfg. Co., Seneca Falls,
N. Y.
- Saw Sets.**
Taintor Mfg. Co., 84-86 Chambers, N
- Scales, Manufacturers of.**
Buffalo Scale Co., Buffalo, N. Y.
Chadillon, John & Sons, 85-89 Cliff, N. Y.
- Scrapers, Road.**
Am. Steel Scraper Co., Sidney, Ohio.
Kilbourne & Jacobs Mfg. Co., Colum-
bus, O.
Sidney Steel Scraper Co., Sidney, O.
- Screens, Coal and Ore.**
Hendrick Mfg. Co., Ltd., Carbondale,
Pa.
- Screens, Door and Window.**
White, Van Gahn & Co., 15-17 Chatham
Sq., N. Y.
- Screw Cutting Machinery.**
Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield,
Mass.
- Screw Drivers.**
Brown, R. H. & Co., New Haven, Conn.
Mayhew, A. H. Co., Shelburne Falls,
Mass.
- Screw Plate and Pipe Cutter.**
Jarecki Mfg. Co., Erie, Pa.
- Screws, Makers of.**
American Screw Co., Providence, R. I.
Blake & Johnson, Waterbury, Conn.
Wm. H. Haskell Co., Pawtucket,
Mass., 2. S., 205 Quarry, Philadelphia.
Reynolds & Co., New Haven, Conn.
Worcester Machine Screw Co., Wor-
cester, Mass.
- Screw Saws.**
Barnes, W. F. & John, Rockford, Ill.
Seneca Falls Mfg. Co., Seneca Falls, N. Y.
- Seythe Stones and Whetstones.**
Pike Mfg. Co., Pike Stat'n, N. H.
Cleveland Stone Co., Cleveland, O.
- Shafting, Makers of.**
Cresson, Geo. V. Co., Philadelphia, Pa.
Fairmount Mch. Co., Philadelphia, Pa.
Fitzsimons & Co., Cleveland, Ohio.
Sellers, Wm. & Co., Inc., Phila. Pa.
Stow, Co. Mfg., Binghamton, N. Y.
- Shaped Iron and Steel, Manu-
 facturers of.**
Etna-Standard Iron & Steel Co.,
Bridgeport, O.

- Allentown Rolling Mill, Allentown, Pa.**
 Loggert Iron & Steel Co., Pittsburgh, Pa.
Pasaden Rolling Mill Co., Paterson, N.J.
 Pottsville Iron & Steel Co., Pottsville, Pa.
 Roberts, A. & P. Co., Phila., Pa.
 The Phoenix Iron Co., Phila., Pa.
 Tudor Iron Works, St. Louis, Mo.
- Shears and Scissors.**
 Ames Shear Co., Bridgeport, Conn.
 Heinisch, E. Sons Co., Newark, N. J.
- Sheet Iron and Steel, Manufacturers of.**
 Etna-Standard Iron and Steel Co., Bridgeport, O.
 Cambridge Iron & Steel Co., Cambridge, Ohio.
 Chess Bros., Pittsburgh, Pa.
 Mahoning Valley Iron Co., Livingston, Ohio.
 Moorehead-McCleane Co., Pittsburgh, Pa.
 Pierson & Co., 29 Broadway, N. Y.
 Singer, Nimick & Co., Ltd., Pittsburgh, Pa.
 The Mahoning Valley Iron Co., Youngstown, O.
 Alan Wood Co., Philadelphia.
 W. Dewees Wood Co., McKeesport, Pa.
- Sheet Zinc.**
 Mathlessen & Hegeler Zinc Co., La Salle, Ill.
- Shelf Brackets.**
 Koch, A. B. & Co., Peoria, Ill.
- Sinks.**
 Douglas, W. & B., Middletown, Conn.
- Skates, ice.**
 Lovell, Jno. P. Arms Co., Boston, Mass.
 Winslow, Sam'l, Skate Mfg. Co., Worcester, Mass.
- Skates, roller.**
 Henley, M. C., Richmond, Ind.
 Winslow, Sam'l, Skate Mfg. Co., Worcester, Mass.
- Smelting Works.**
 Reeves, Paul S., 760 S. Broad, Phila.
- Soldering Coppers.**
 Clendenin Bros., Baltimore, Md.
 Covert Mfg. Co., West Troy, N. Y.
- Speaking Tubes.**
 Ostrander, W. R. & Co., 204 Fulton St., N. Y.
 Wollensak, J. F., Chicago, Ill.
- Specialties, Pat. Articles.**
 Rhodes, L. E. Co., Hartford, Conn.
- Spelter.**
 Mathlessen & Hegeler Zinc Co., La Salle, Ill.
 Missouri Metal Co., St. Louis, Mo.
- Spoons and Forks.**
 Boardman, L. & Son, New Haddam, Conn.
 Holmes & Edwards Silver Co., Bridgeport, Conn.
 Rogers, The Wm. Mfg. Co., Hartford, Conn.
- Sporting Goods.**
 Hartley & Graham, 818-815 B'way, N. Y.
- Spring.**
 Clark & Cowles, Plainville, Ct.
 Dunbar Bros., Bristol, Conn.
 Miller & Van Winkle, Brooklyn, N. Y.
 Morgan Spring Co., Worcester, Mass.
 Roland, Wm. & Harvey, Phila., Pa.
 Sablin Machine Co., Montpelier, Vt.
 Tuck Mfg. Co., Brockton, Mass.
 Washburn & Moen Mfg. Co., Worcester, Mass.
 Wolf, R. H. & Co., Ltd., 118th St. and Harlem River, N. Y.
- Spring Hinges.**
 Fullman Sash Balance Co., Rochester, N. Y.
 Stover Mfg. Co., Freeport, Ill.
 Van Wagoner & Williams Co., 14 Warren St., N. Y.
- Stamped Ware.**
 Am. Stamping Co., 104 & 106 John St., New York.
- Stamping Works.**
 Cleveland Stamping & Tool Co., Cleveland, O.
- Staples.**
 Cobb & Drew, Plymouth, Mass.
 Titcheener E. H. & Co., Binghamton, N. Y.
- Steam Gauges.**
 Bristol Co., Waterbury, Conn.
- Steam Hammers, &c., Makers of.**
 Dinclat & Eisenhardt, Philadelphia.
 Dudgeon, Richard, 24 Columbia Street, N. Y.
 Trethewey Mfg. Co., Pittsburgh, Pa.
- Steam Heating.**
 Webster Warren & Co., Camden, N. J.
- Steam Separators.**
 Gouvert Mfg. Co., 32 Cortland St., N. Y.
 Harrison Safety Boiler Wks., Phila. Pa.
- Steel, Cold Rolled Strip.**
 Superior Steel Co., Pittsburgh, Pa.
 Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Steel Figures and Alphabets.**
 Hoefig, C. W., 52 Fulton St., N. Y.
 Hoggson & Pettis Mfg. Co., New Haven, Conn.
 Krogerud, W., 61 Fulton, N. Y.
 Wolff, O. H., 177 William St., N. Y.
- Steel Importers.**
 Abbott, Wheelock & Co., N. Y. and Boston.
 Hobson, Francis, Seaman & Co., 97 John St., N. Y.
 Jessop, Wm. & Sons, Sheffield, Eng.
 Land, or 91 John, N. Y.
 Milne, A. & Co., 1 Broadway, N. Y.
 Newton & Shipman, 88 John, N. Y.
 Wetherell Bros., 93 Liberty St., N. Y.
 Whitney, A. R. & Co., B'way, N. Y.
 Wolff, R. H. & Co., Ltd., 118th St. and Harlem River, N. Y.
- Steel (Mushet's Special).**
 Jones, B. M. & Co., Boston.
- Steel Manufacturers.**
 Etna-Standard Iron & Steel Co., Bridgeport, O.
 Bethlehem Iron Co., S. Bethlehem, Pa.
 Boker, Herman & Co., 103 Duane St., Carbon Steel Co., Pittsburgh, Pa.
 Chester Steel Castings Co., Phila., Pa.
 Chrome Steel Works, Brooklyn, N. Y.
 Crescent Steel Co., Pittsburgh, Pa.
 Eiken & Co., Hagen, Germany.
 Frankford Steel Co., Philadelphia.
 Gaudier Steel Department of Cambria Iron Co., Johnstown, Pa.
 Hobson, Francis, Seaman & Co., 97 John St., N. Y.
 Jessop, Wm. & Sons, Sheffield, Eng.
 Kayser, Ellison & Co., Sheffield, Eng.
 La Belle Steel Co., Pittsburgh, Pa.
 Lukens Iron & Steel Co., Coatesville, Pa.
 Moorehead-McCleane Co., Pittsburgh, Pa.
 Moss, F. W., 88 John, N. Y.
 Naylor & Co., 45 Wall, N. Y.
 Pottsville Iron and Steel Co., Pottsville, Pa.
 Rowland, Wm. & Harvey, Frankford, Philadelphia.
 Singer, Nimick & Co., Pittsburgh.
 Steel & Iron Improvement Co., Pittsburgh, Pa.
 Superior Steel Co., Pittsburgh, Pa.
 Wordlaw, S. & Co., Sheffield, Eng.
 Wetherell Bros., 93 Liberty, N. Y.
 Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.
- Steel, Manufacturers' Agents.**
 Barnes, C. K. & Co., Philadelphia, Pa.
 Corning, Edw. & Co., 29 B'way, N. Y.
 Lindsay, Jas. G. & Co., Phila., Pa.
 Pierson & Co., 29 Broadway, N. Y.
- Steel Rails, Manufacturers of.**
 Bethlehem Iron Co., S. Bethlehem, Pa.
 Cambria Iron Co., Johnstown, Pa.
 Montour Iron & Steel Co., Danville, Pa.
 Riverside Iron Wks., Wheeling, W. Va.
- Steel, Tool.**
 Frankford Steel Co., Philadelphia, Pa.
 Jessop, Wm. & Sons, Sheffield, Eng.
 Land, or 91 John, N. Y.
 Jones, B. M. & Co., Boston, Mass.
 La Belle Steel Co., Pittsburgh, Pa.
- Step Ladders.**
 Bicycle Step Ladder Co., Chicago, Ill.
 Croissant, M., Albany, N. Y.
- Stocks and Dies.**
 Armstrong Mfg. Co., Bridgeport, Conn.
 Billings & Spencer Co., Hartford, Conn.
 Butterfield & Co., Derby Line, Vt.
 Hart Mfg. Co., Cleveland, O.
 Saunders' Sons, D., Yonkers, N. Y.
 Wells Bros. & Co., Greenfield, Mass.
 Wiley & Russell Mfg. Co., Greenfield, Mass.
- Stove Linings.**
 Ostrander Fire Brick Co., Troy, N. Y.
- Stove Pipe Thimbles.**
 Cheney, S. & Son Manlius, N. Y.
- Street Lamps.**
 Steam Gauge & Lantern Co., Syracuse, N. Y.
- Strops.**
 J. R. Torrey & Co., Worcester, Mass.
- Structural Iron Work.**
 Lindsay, Jas. G. & Co., Phila., Pa.
- Sulphuric Acid.**
 Mathlessen & Hegeler Zinc Co., La Salle, Ill.
- Tacks, Brads, Staples, &c.**
 Atlas Tack Corporation, Boston, Mass.
 Clendenin Bros., Baltimore, Md.
 Cobb & Drew, Plymouth, Mass.
 Grand Crossing Tack Co., Grand Crossing, Ill.
- Taps and Dies.**
 Butterfield & Co., Derby Line, Vt.
 Carpenter, J. M., Tap & Die Co., Pawtucket, R. I.
 Manning, Maxwell & Moore, 111 Liberty St., N. Y.
 Wells Bros. & Co., Greenfield, Mass.
 Wiley & Russell Mfg. Co., Greenfield, Mass.
- Testing Laboratories.**
 Richle Bros. Testing Mch. Co., Philadelphia.
- Testing Machines.**
 Richle Bros. Testing Mch. Co., Phila.
- Theatrical Hardware.**
 Wollensak, J. F., Chicago, Ill.
- Thill Springs.**
 Frost Thill Spring Co., Boston, Mass.
 Sablin Machine Co., Montpelier, Vt.
- Timber and Mineral Land.**
 Robertson, E. Co., Cincinnati, O.
- Time Record.**
 Scattergood, H. W., Phila., Pa.
- Tinning Process.**
 Sands, Thomas, Nashua, N. H.
- Tin Plate Machinery.**
 Lloyd Booth Co., Youngtown, Ohio.
- Tinware.**
 Am. Stamping Co., 104 & 106 John St., New York.
- Tire Upsetters.**
 Butts & Ordway, Boston, Mass.
- Toe Calks, Steel.**
 Burke, P. F., Boston, Mass.
- Tool Blocks.**
 Hulbut-Rogers Mch. Co., South Sudbury, Mass.
- Tool Chests.**
 Am. Tool Co., 200 W. Houston St., N. Y.
- Tools.**
 Brown, R. H. & Co., New Haven, Conn.
 Frasse Co., 19 Warren St., New York.
 Mayhew, H. H. Co., Shelburne Falls, Mass.
 Millers Falls Co., 93 Reade, N. Y.
 Richardson, O. F. & Son, Athol, Mass.
 Stanley Rule & Level Co., 29 Chambers, Starrat, L. S., Athol, Mass.
 Wilkinson, A. J. & Co., Boston, Mass.
- Tools, Blacksmith and Wheelwrights.**
 Buffalo Forge Co., Buffalo, N. Y.
 Butts & Ordway, Boston, Mass.
 Champion Blower & Forge Co., Lancaster, Pa.
 Plumb, Fayette R., Philadelphia, Pa.
 Wiley & Russell Mfg. Co., Greenfield, Mass.
- Tools, Steam and Gas Fitters'.**
 Saunders' Sons, D., Yonkers, N. Y.
- Torches, Oil and Gasolene.**
 Dangler Stove & Mfg. Co., Cleveland, O.
 Schneider & Trenkamp Co., Cleveland, Ohio.
- Transom Lifters.**
 Wollensak, J. F., Chicago, Ill.
- Tricycles.**
 Toledo Metal Wheel Co., Toledo, Ohio.
- Trucks, Manufacturers of.**
 Clark, G. P., Windsor Locks, Conn.
 Lansing Wheelbarrow Co., Lansing, Mich.
- Tubes, Seamless Drawn Copper.**
 Ansonia Brass & Copper Co., 19 and 21 Cliff, N. Y.
 Randolph & Clowes, Waterbury, Conn.
- Tubes, Steel.**
 Ellwood Shafting & Tube Co., Ellwood City, Pa.
 Leng's John S. Son & Co., 4 Fletcher St., New York.
 U. S. Projectile Co., Brooklyn, N. Y.
- Tumbling Barrels.**
 Henderson Bros., Waterbury, Conn.
- Turnbuckles.**
 Cleveland City Forge & Iron Co., Cleveland, O.
 Merrill Bros., Brooklyn, E. D.
- Twist Drills, Makers of.**
 Cleveland Twist Drill Co., Cleveland.
 Morse Twist Drill & Machine Co., New Bedford, Mass.
 New Process Twist Drill Co., Taunton, Mass.
 Standard Tool Co., Cleveland.
- Valves, Gas, Water and Steam.**
 Best, Fox & Co., Pittsburgh, Pa.
 Chapman Valve Mfg. Co., Boston.
 Eynon-Evans Mfg. Co., Philadelphia, Pa.
 Jenkins Bros., 71 John, N. Y.
 Lunkenheimer Co., Cincinnati, O.
 McNab & Harlin Mfg. Co., 66 John, N. Y.
- Ventilator Appliances.**
 Howard & Morse, 45 Fulton, N. Y.
- Vise Jaws.**
 Newark Mch. Tool Co., Newark, N. J.
- Vises.**
 Athol Machine Co., Athol, Mass.
 Hollands Mfg. Co., Erie, Pa.
 Howard Iron Works, Buffalo, N. Y.
 Millers Falls Co., 93 Reade St., N. Y.
 Prentiss Vise Co., 44 Barclay N. Y. Y.
 Van Wagoner & Williams Co., Warren St., N. Y.
- Wagon Jacks.**
 Covert Mfg. Co., West Troy, N. Y.
 Covert's Saddlery Works, Farmer, N. Y.
- Washers.**
 Haskell, Wm. H. Co., Pawtucket, R. I.
 Milton Mfg. Co., Milton, Pa.
 Sternbergh, J. H. & Son, Reading, Pa.
- Washing Machines.**
 Richmond Cedar Works, Richmond, Va.
- Water Meters.**
 Worthington, Henry R., 86 & 88 Liberty St., N. Y.
- Water Wheels.**
 Poole, Robt. & Son Co., Baltimore, Md.
- Well Buckets.**
 Richmond Cedar Works, Richmond, Va.
- Wheelbarrows.**
 Amer. Steel Scraper Co., Sidney, Ohio.
 Byram Mfg. Co., Byram, Ohio.
 Kilbourne & Jacobs Mfg. Co., Columbus, Ohio.
 Lansing Wheelbarrow Co., Lansing, Mich.
 Sidney Steel Scraper Co., Sidney, O.
- Window Cord, Makers of.**
 Samson Cordage Works, Boston, Mass.
- Wire, Manufacturers of.**
 Gaudier Steel Department of Cambria Iron Co., Johnstown, Pa.
 Miller & Van Winkle, Brooklyn, N. Y.
 New Castle Wire Nail Co., New Castle, Pa.
 New Haven Wire Mfg. Co., New Haven, Conn.
 Prentiss, Geo. W. & Co., Holyoke, Mass.
 Salem Wire Nail Co., Salem, Vt.
 Trenton Iron Co., Trenton, N. J.
 Washburn & Moen Mfg. Co., Worcester.
 Wetherell Bros., 93 Liberty St., N. Y.
 Wolf, R. H. & Co., Ltd., 118th St. and Harlem River, N. Y.
 Wright & Colton Wire Cloth Co., Worcester, Mass.
- Wire Cloth.**
 Barnum, E. T., Detroit, Mich.
 Clinton Wire Cloth Co., Clinton, Mass.
 Darby, Edward & Sons, Philadelphia.
 Estey, W. S., 65 Fulton, N. Y.
 Gilbert & Bennett Mfg. Co., 42 Cliff.
 Howard & Morse, 45 Fulton, N. Y.
 N. J. Wire Cloth Co., Trenton, N. J.
 Scheeler & Sons, Buffalo, N. Y.
 Wickwire Bros., Cortland, N. Y.
 Wright & Colton Wire Cloth Co., Worcester, Mass.
 W. S. Tyler Wire Works Co., Cleveland.
- Wire Cutters.**
 King, J. M. & Co., Watertown, N. Y.
- Wire Dies.**
 McFarland, Wm., Trenton, N. J.
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- Wire Fences.—See Fencing, Iron and Wire.**
- Wire Goods, Manufacturers of.**
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 Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.
 Ludlow-Saylor Wire Co., St. Louis.
 Ossavan Mills Co., Norwich, Conn.
 Scheeler & Sons, Buffalo, N. Y.
 Wickwire Bros., Cortland, N. Y.
 Williamson, C. T. Wire Novelty Co., Newark, N. J.
- Wire Machinery.**
 Am. Tool Wks., Cleveland, O.
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 Morgan Construction Co., Worcester, Mass.
 Waterbury Mch. Co., Waterbury, Conn.
- Wire Straightening and Outing Machinery.**
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- Wire Nails.**
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 Indiana Wire Fence Co., Crawfordsville, Ind.
 Kilmer Mfg. Co., Newburg, N. Y.
 New Castle Wire Nail Co., New Castle, Pa.
 Phillips, Townsend & Co., Phila.
 Salem Wire Nail Co., Salem, O.
 Taunton Wire Nail Co., Taunton, Mass.
 Whitney, A. R. & Co., New York.
- Wire Rops, Steel.**
 New Castle Wire Nail Co., New Castle, Pa.
 Washburn & Moen Mfg. Co., Worcester, Mass.
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- Wire Rope, Iron and Steel Makers.**
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 A. Leschen & Son Rope Co., St. Louis.
 Trenton Iron Co., Trenton, N. J.
 Washburn & Moen Mfg. Co., Worcester, Mass.
 Williamsport Wire Rope Co., Williamsport, Pa.
- Wood-Working Machinery.**
 Egan Co., Cincinnati, O.
 Seneca Falls Mfg. Co., Seneca Falls, N. Y.
 Wilkinson, A. J. & Co., Boston, Mass.
- Wrenches, Manufacturers of.**
 Bemis & Call Hardware & Tool Co., Springfield, Mass.
 Billings, Spencer & Co., Hartford, Conn.
 Coes Wrench Co., Worcester, Mass.
 Trimont Mfg. Co., Roxbury, Mass.
 Walworth Mfg. Co., Boston, Mass.
 Williams, J. H., Brooklyn, N. Y.
- Wringers.**
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 Peerless Mfg. Co., Cleveland, Ohio.

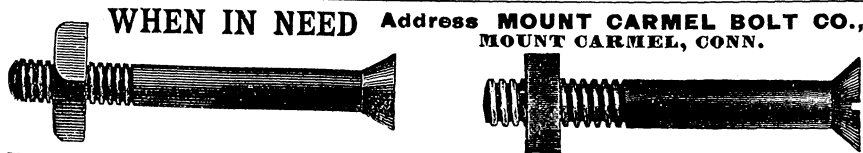
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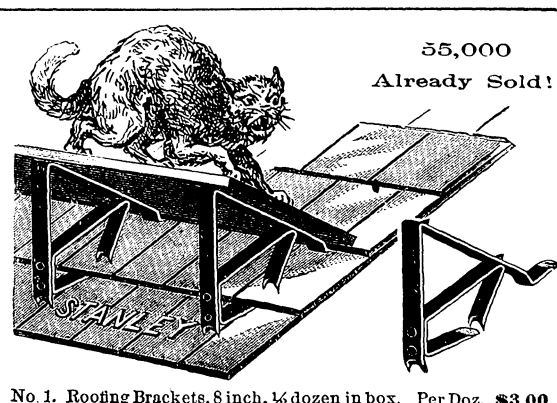
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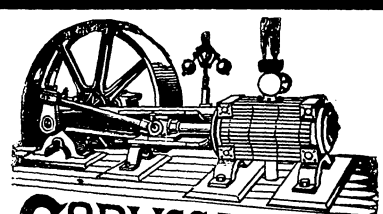
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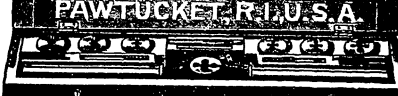
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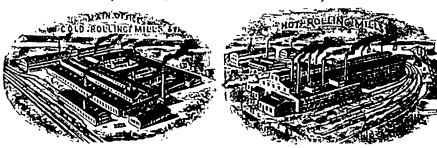
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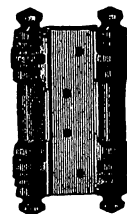
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THE IRON AGE

THURSDAY, MARCH 8, 1894.

Direct Connected Ideal Engine.

The direct connected combination of engine and dynamo of to-day is demonstrating, by an increasing number of plants, its practicability, efficiency and sound principles.

The engraving here presented shows a combination consisting of a multipolar dynamo of the Waddell-Entz type, driven by a Harrisburg tandem compound Ideal self oiling engine. The dynamo is 80 K. W. capacity and the engine cylinders 10 inches and 17 inches by 12 inches, built for running, in this instance, non-condensing. The speed of the combination is 260 revolutions per minute and it operates under a pressure of 115 to 125 pounds.

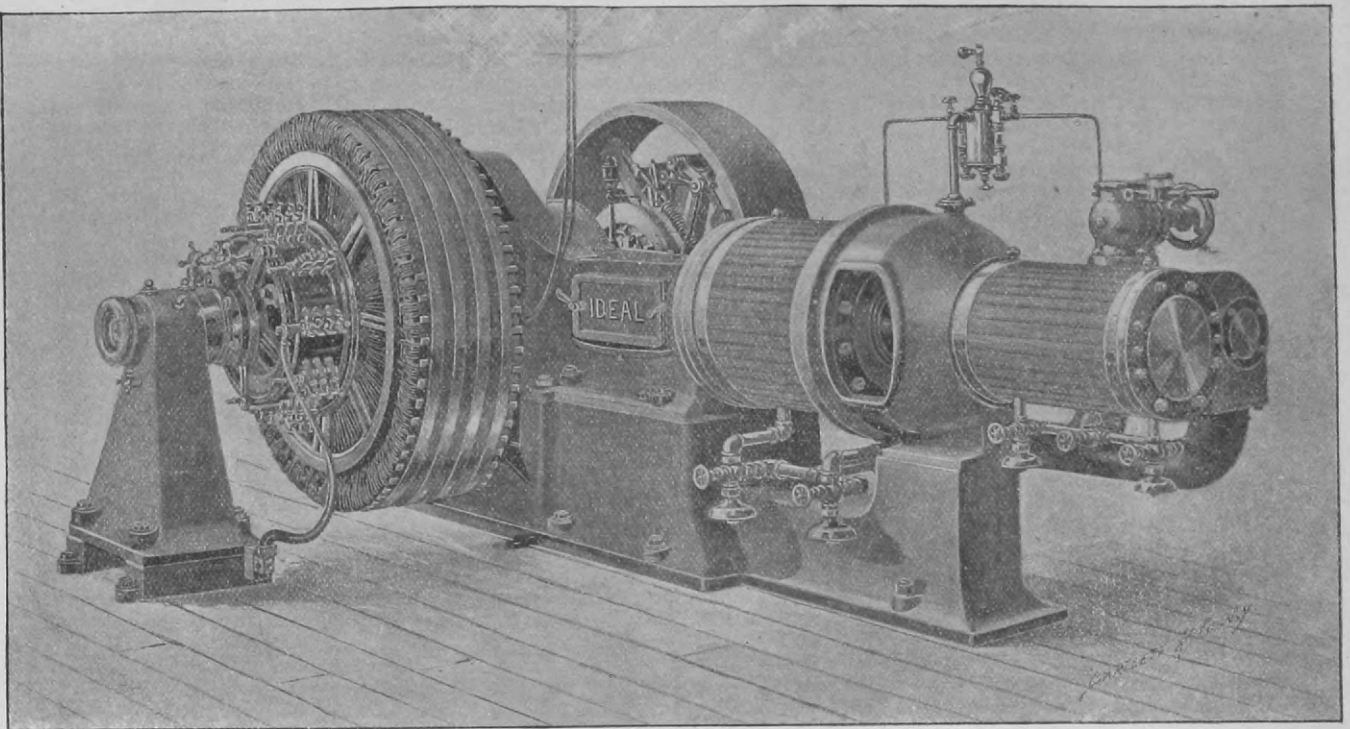
pig iron for export, the reports coupling the transaction with a price of \$5.50 per ton at furnace. We are advised that the only foundation for such stories is that one of the furnaces in the Birmingham district obtained an order for 100 tons for export via New Orleans. The price was equivalent to that obtained for similar quantities and grades from American customers.

Economy of Compound Locomotives.

Concerning this question the *Railroad Gazette* says: Two railroads that have been experimenting with compound locomotives for the past two years have reached the important conclusion that

the revival of locomotive building it is probable that a larger percentage of compounds will be built than ever before; and in the near future the majority of all engines to be used exclusively on grades will undoubtedly be compounded, for reasons that we have often set forth.

The National Chemical Works of Cragin, Ill., are manufacturing Bonnell's Nubian system of scale prevention in steam boilers. The Nubian scale prevention, as it is termed, is not a scale solvent, because the manufacturers claim that any article which will dissolve scale will injure the metal of the boiler. It has as its base tri-basic sodium phosphate, with which are combined the



DIRECT CONNECTED IDEAL ENGINE.

All the bearing surfaces of the engine are supplied with continuous streams of oil. In direct connected work of this character it is extremely important that the dynamos should be kept as free from oil as possible, for it has been proved that short circuits of dynamos are most frequently traced to the throwing or conveying of oil from the engine to the dynamo, and short circuiting, with its attendant delays, is the result. As to the economy of this combination it is stated that a water consumption is obtained in service of 23 pounds per horse-power per hour non-condensing. This engine is built by the Harrisburg Foundry & Machine Works of Harrisburg, Pa., and was installed at the Bridgeport Copper Company by W. R. Fleming & Co., their representatives for New York and Boston.

Rumors have been current in pig iron circles that a furnace in the Birmingham district had made an important sale of

in freight service the compound locomotive, if reasonably well designed, will, without unusual care, effect a saving in fuel of fully 20 per cent. Most of the old prejudice against the compound mechanism is gone; it has been driven out by daily experience with the devices, accomplished in these two cases by shifting the compound from one division of the road to another, and finally leading to a recommendation to the management to consider the advisability of using compounds hereafter. Using 20 per cent. less fuel and water means less labor in several directions, and some considerable decrease in the cost of repairs to the boilers. The Compound Locomotive Committee appointed by the Master Mechanics' Association several years ago must have been discontinued last year, as there is no announcement of such a committee in the list given in the last "Proceedings." Such a committee would find more to report upon this year than it had last, and it is unfortunate that it was discontinued. Upon

proper ingredients to prevent scale formation. Its action is such as to prevent additions to the scale deposit and to cause the disintegration and dropping off of the old scale in a short time. The Nubian prevention is stated to be especially efficacious in marine boilers and others in which the cylinder oils get into the feed water. Prices and full directions for its use are given in a neat little pamphlet which has just been issued by the company.

The Iowa Iron Works of Dubuque have just closed a contract with Capt. L. E. Patton of Memphis for a new steel hull steamer. The craft is to be 125 feet in length, 20 feet beam and 4½ feet deep, and is to be completed by June. The steamer "J. S. Keator" has been purchased from the Diamond Jo Line, and its machinery, which is almost new, will be used in the new boat. The boat will be used at Memphis for towing purposes.

Western Foundrymen's Association.

The regular meeting of the Western Foundrymen's Association was held Wednesday afternoon, February 28, at 225 Dearborn street, Chicago, the president, G. M. Sargent, in the chair. F. W. Sargent of Chicago and A. K. Beckwith of Dowagiac, Mich., were unanimously elected to membership in the association.

Under the head of unfinished business a paper by E. A. Wheeler, entitled "Furnace vs. Foundry Practice," in reply to Mr. Keep's criticism before the Foundrymen's Association of Philadelphia of Mr. Wheeler's paper before the December meeting of this association, was read by the secretary, as follows:

Furnace vs. Foundry Practice.

BY E. A. WHEELER.

After reading the remarks of your December meeting, and Mr. Keep's paper on "Foundry Chemistry," I have concluded that the subject of chemistry in foundry practice is not exhausted, and further investigation would interest and perhaps be profitable to the members of your association.

It is pretty generally admitted by all parties who have investigated this subject that silicon governs the quality of iron in the castings. Mr. Keep says: "Silicon is the only thing necessary to the founder, as all other things in cast iron can be overlooked." He further says: "If we are correctly informed these very furnaces have to ask a leeway of 1 per cent. of silicon on all contracts." If this is so, then all our theory of chemistry is good for nothing, for a variation of 1 per cent. either way, too much or too little, is enough to spoil a y casting, and I wish to say right here that chemistry covering the analysis of iron, steel and ore in all their branches has been reduced to a science and is absolutely correct, and the gentlemen who follow the occupation take great pride in their profession. I have no doubt that analyses have been doctored to work off a bad lot of iron, but not by the chemist. I would as soon think of asking our bookkeeper to make a false entry in our books as to ask our chemist to give me a wrong analysis. That is the reason why I would recommend a chemist's card with each car of iron. I hope to show how the principle can be carried out and every foundryman can have all the benefits of a chemist without any extra expense to himself regarding the pig iron used.

We often hear people talk about burned iron in the furnace and cupola; in fact, one of our customers wrote us that "the last car of iron you sent us is not good; it was burned in the furnace and the shipper knew it." The iron was very hot and the ends of the pigs where broken from the sow were pitted with free carbon, a sure sign of good iron. In fact, it is impossible to burn iron either in the furnace or cupola, for the reason that as soon as the iron is melted in either case it drops down through the cinder that floats on top of the iron, and is thoroughly protected from the blast oxidation. Just a few weeks ago one of our largest consumers of iron told us something was wrong with our iron, it not holding out; it seemed to be burning up in the cupola. Upon investigation we found his cupola working very cold. He had a large tap hole for

cinder, and it was very low and close to the iron. He was leaving it open, and a large volume of burning gas was escaping and a black, ropy cinder pouring out. The mystery was soon solved. The cinder tap was too low and had drained all the cinder off the iron, leaving it exposed to the blast and the iron was being oxidized and going off with the slag. We afterward analyzed the slag and found that it contained over 22 per cent. of iron. It is a bad practice to tap out cinder too close to the iron, and unless you are melting a very large amount of iron at a time it would be better not to use a cinder tap; rather use a little less lime. Black, glassy cinder, either from the blast furnace or cupola, indicates a cold furnace and that the iron and cinder are not separating.

Mr. Keep says: "It is not necessary to use high priced silicon iron, as any iron containing from 4 to 6 per cent. of silicon, with phosphorus not over 1 per cent., is better." If an iron running from 4 to 6 per cent. silicon is not high priced I do not know what is. I do not know of any furnaces offering iron as high as 6 per cent. silicon; in fact, iron containing 7 per cent. or over is no longer called iron, but is known as ferrosilicon and is mostly imported. If an iron running 1 per cent. in silicon is worth \$10 per ton, then iron containing 6 per cent. silicon should be worth \$16 per ton, because it will cost very nearly that much more, since it requires at least 1000 pounds more coke to make the 6 per cent. than the 1 per cent. silicon. Besides, the furnace being so much hotter is more liable to hang and slip and make less iron. Then, too, it is very hard to keep a furnace on that grade of iron, and I do not know of any one making it. The American Scotch irons do not average over 3 per cent. silicon and they are used for softeners. A 3 per cent. silicon iron will carry its own weight in scrap and make good castings and even more if you want strong castings.

It is very true, as Mr. Keep says, "That it would not pay a foundryman to keep a chemist," for the reason that a laboratory is expensive, and to be kept in order should be in constant use. Mr. Keep further says: "Any forehanded founder will purchase large quantities of pig iron when the market is low and will not have room to keep a record of where each car is placed, even if it were desirable to do so." On this question I am ready to rest my case. If it is a fact that foundrymen cannot or will not pile their own iron so that they can keep a record of each carload that comes into their yards, then the chemistry or any other system of order is a failure in the foundry business, and they have no use for analyses and must continue in the old rut. The writer has been in a great many metal yards and must admit that he has never seen a well kept, orderly, yard about a foundry, as most of them are a conglomeration of confusion, a reception for everything not in immediate use about the place. But cannot this be remedied, now that we are talking of reform? Suppose, for example, we wish to keep each carload separate. The pigs are 40 inches long (this being about the average length) and we find some place handy to the drive where we can clean a space 4 feet wide and 12 feet long, and we start three piles, each 40 inches square, crossing each layer. We will find when we have the car unloaded we have three piles stacked neatly, each pile almost exactly 6 feet high. Now we take some white

paint and mark on each pile on the face of a smooth pig the date of invoice and the percentage of silicon, and the job is finished, and that lot of iron will never get mixed with other iron until the last pig is used. We get another lot and treat it the same way, and so on. Would not the yard soon get in good shape? If the iron is broken pile it in the same way; you will have more piles but it will take no more room. You will soon find room is getting plenty.

Now, in regard to scrap, I would build a plank wall alongside the drive or scale, 5 feet high, 20 feet long, and always throws the scrap over the wall and work from each end. This will always keep the side next the scale or road in good shape. This would be better than a plank box. Now that we know the silicon contained in the pig iron on hand, the only question is, What does the scrap carry? Scrap does not vary in silicon like pig iron. It seldom varies over 1 per cent. Stove plate and light scrap will run about 2 per cent.; good machine scrap, 1½ per cent.; car wheels, plow castings, &c., 1 per cent.; charcoal scrap, about 1 per cent. In making up the heat we would have to make some allowance for the kind of scrap which would be used. If we want to be very particular, the man selecting the scrap will use a small hammer and hit the scrap, and he can tell whether the silicon is high or low. If the scrap gives a sharp, hard ring the silicon is low, and *vice versa*. Now, with our pig iron in the yard and knowing just what it runs in silicon, and knowing so near what our scrap carries, would there be any trouble in telling how to make a mixture running 2 per cent. for stoves or 1½ per cent. for machine work and 1 per cent. for plows and close castings? Now is the time when Mr. Keep's test bars would come in. Try the mixture, and when you have it just right for your purpose you can rely on the same castings until the stock is all used up. We believe in the test bars, provided they are used in connection with chemistry, and we hope some day to have a small cupola and testing scales in connection with our laboratory.

There is quite a difference in opinion about the effects of sulphur in foundry iron. Some contend that a small amount of sulphur increases the strength of the iron. A car wheel made from coke iron running one-half of 1 per cent. in silicon would chill and be equally as hard as one made from the same grade of charcoal iron, but owing to the sulphur if it did not break in cooling it would fracture with the first rap it got, proving conclusively that the difference in the strength of the two irons is caused by the difference in sulphur they contain. The sulphur in coke iron comes mostly from the fuel. Charcoal being free from sulphur we get a low silicon iron free from sulphur, and a strong iron for car wheels, rolls, &c. It has been quite a mystery among furnacemen why high silicon iron should be low in sulphur and low silicon iron high in sulphur all made from the same stock and perhaps on the same day. It is the opinion of the writer that all iron as it runs from the furnace, made from the same stock, contains about the same amount of sulphur. The high silicon iron is always very hot and remains fluid a long time, and sulphur being very volatile escapes before the iron cools and leaves a smooth face on the pig; while low silicon iron comes from the furnace cold and chills as soon as it can be got in the beds and be-

fore the sulphur has time to escape. The evidence of this is that in high sulphur iron the tops or faces of the pigs are always honeycombed and have a pock marked or rough appearance, showing that the sulphur gases were escaping when the iron chilled. Another evidence of this is that we find the top of the iron contains more sulphur than the bottom of the pig or middle, showing the sulphur was caught by the iron chilling before it had time to escape. Would not the same principle hold good in the cupola? If so, melt your iron hot.

Discussion.

Mr. Moore: There has been a good deal of criticism upon Mr. Keep's statements regarding chemistry. He has, I think, occupied a unique position among foundrymen for some years, and has been quoted both here and abroad. He has tabulated his experiments and has obtained data which I doubt any one else has from the same number of experiments. He has apparently exhausted one phase of the question—physical tests—and I have always heard his opinion regarding foundry work quoted with the greatest respect until he began to attack the chemists. In doing that he has raised somewhat of a tempest in the teapot, in rather a large teapot. One of the trade papers within the last week contained an article from some English society of engineers or chemists, in which Mr. Keep was given considerable criticism for his position regarding chemistry, and the statement that chemistry and the foundryman had nothing in common, and especially his reference to silicon as being the only element which one had to take into consideration in working pig iron, and his statement that sulphur in the quantities in which it appeared originally in cast iron was of no significance. I think Mr. Wheeler's criticism is very good, and such experience as we have had certainly bears out his statements. It is not a difficult thing for a foundryman to classify his stock and use it intelligently, all it requires is the disposition to do so. The statement that he makes regarding sulphur in the iron and the use of slag, and its influence upon the sulphur in the iron, is one that is new to me, but it seems to me that there is a great deal in that. He states that one of his customers was making slag containing 20 or 30 per cent. of iron. If that is possible, it is a thing for which we should all watch out. I was not aware before this statement was made that this state of things could exist. Some of us may be slagging our cupolas at very great expense.

Mr. Beckwith: The idea that slag contains iron is a new one to me and a very valuable one, too. I had never thought of it. I have noticed that our slag is sometimes of a very dark color. I shall look into the matter more closely in the future.

Mr. Graves: I have always thought, in melting very dirty iron, that we had better results in melting it very hot. It is news to me that slag carries off as great a per cent. of iron as has been stated.

Mr. Whiting: I have used a physical test for a great many years and I never found a very great loss of iron. The loss would average up to about $3\frac{1}{2}$ per cent., and I always took it for granted that that was a satisfactory result. I have melted 80 to 90 tons per day and kept the record for four or five days. The way we got at it was we kept an accurate record of the iron melted in the cupolas and at the end of the year took

the sales and account of stock on hand. I never discovered there was very much loss, not more than $3\frac{1}{2}$ per cent.

Mr. Beckwith: Our cupola is sometimes run through the heat without slagging. My idea from the paper is that the slag is run off close to the iron and exposes the iron.

Mr. Moore: In our case we have a slag hole that is low, and it is possible that we are doing, without knowing it, the very thing that this man was doing.

Mr. Vrooman: Mr. Keep must at some time have employed a chemist. Without it he could not give the points he does. I do not see why he should go back on the chemist.

Mr. Sargent: Mr. Keep thinks it would not pay to keep a chemist in the foundry as a general thing; he does not condemn the chemist.

The secretary then read the following paper by Simpson Bolland:

A Foundryman on Foundry Chemistry.

BY SIMPSON BOLLAND.

We who are not chemists naturally cling tenaciously to the only tangible support that, up to the present, has been vouchsafed us—viz., the testing machine; and I am persuaded that it will take some time to convert the large majority of founders to a belief in this (to them) new departure. My first acquaintance with this subject dates from the time when I was associated with Mr. Molin, metallurgical chemist, New York City. At that time I looked upon the faculty as a decided superfluity in a foundry, but it gives me pleasure to say that, while he noticed my self assurance, he consistently acted not only the scholar, but the gentleman. He also unmistakably demonstrated his ability to accomplish, by chemical analysis, what had before seemed impossible of accomplishment; and, while he may not have made a chemist out of such crude material, I am certainly a sound convert to the methods of which he is so able an exponent.

A careful perusal of Mr. Keep's able papers and other kindred works, as well as the exhaustive productions read before this and the Eastern Association by our foremost chemists, has established my belief beyond question. Mr. Henderson, in his address before the Foundrymen's Association of Philadelphia, brings this whole subject out in bold relief when he says: "But what of permanent avail is accomplished by the application of physical tests to material the chemical composition of which is unknown? The very utmost that can be hoped from such tests is to establish the fact that a definite lot of material is either good or bad."

The above is preceded by a forcible plea for the recognition of chemistry as a factor in foundry practice on the following grounds: "That, whereas, it is known that certain impurities in material produce certain characteristic effects upon the physical behavior of manufacture resulting from its employment; that certain combinations of impurities produce certain other effects, and that in the process of conversion, which is in every case a chemical one, these impurities may be eliminated, retained, or forced into combination with others, according to fixed laws and conditions to which they are subjected." But he further affirms that in order to secure a proper adjustment of these proportions, so that the resultant casting shall meet all the requirements in the case, ability of the highest order must be employed, simply because the

line is not so clearly defined, on either side of which an element may not enter into its composition without disaster.

The same author, comparing the value of chemical against physical tests, affirms that: "A fact once established by chemical research remains fixed for all time. When it is known that a certain percentage of an element in a material under certain conditions produces a certain physical effect, every time these conditions are reached in this material having the same percentage of the element this identical physical effect is obtained and no other."

Mr. Keep claims that "intelligent mixing of irons cannot be accomplished without the aid of chemistry, and conclusions must be reached by the united work of chemistry and physical experiment." That the time is not far distant when the chemist will be acknowledged as the supreme factor in foundry economics is significantly put by the same author, who on this phase of the subject says: "If a man with a thorough chemical education would learn to look at general tendencies and not hold so closely to four figures of decimals, and accept the results of late research, he could adapt himself to general foundry work and be of great use. He would soon leave his laboratory and become the practical leader, and would only go back occasionally to solve some problem that needs new light. We cannot have too much respect for chemistry. Practical research could do nothing without it, but after general conclusions are reached, then to be of use the chemist must become the practical metallurgist."

On this head, Professor Torrey cogently informs us "that it takes the skilled metallurgical engineer to reason from the chemistry to the physics of iron; and the chemist must be a good one if the results are to be good for anything."

It may be readily inferred from the preceding that the chemist's work in the foundry must be practical in all its bearings; and that a mere school knowledge of the science would be of little service there.

Subjects like the porosity of castings, cast iron and steel, would, under the supervision of a chemist, be subjected to a superior system of examination; even the ordinary crucible tests would receive his strict attention, with the positive assurance of their being made intelligently. Metal mixing would be transferred from the ignorant mechanic, with his crude systems, to the more positive and scientific methods of chemical research; just where it should have been long ago. For the want of intelligent direction the best systems of mechanical testing have always been more or less defective; and as matters now stand, formulas of any kind are seldom understood and as seldom acted up to; the chemist would change all this with the greatest ease and dispatch. The business of steel founding would have developed more rapidly if the chemist had been consulted with regard to the materials for forming the molds as well as for the metal with which to fill them. Brass founding is almost exclusively a branch of metallurgical chemistry; and it is safe to say that the few advances made in that art have emanated from the chemist's laboratory, rather than the brass shop.

There is nothing used in a foundry that does not require rigid inspection when purchased, such as an able chemist only can give; and it would be to the interest of every firm that not only

the iron, but fuel, sand, fire bricks, clays and every material employed should undergo close scrutiny; by this means all impositions would be at once detected. Already we may observe that sands for foundry purposes are receiving some attention from the chemist.

Analysis at once discovers just what may be used for the numerous classes of castings made. We may expect to be informed that in the great majority of cases we have been unnecessarily annoyed by the presence of elements unfavorable to the production of good castings, when, perhaps, a more suitable material has been overlooked that might have been employed with impunity at a much less cost. The percentage of iron oxide, alumina, organic and volatile matters present being made known, there will be no difficulty in making such selection as will meet every requirement absolutely.

It is reasonable to presume that the advent of a chemist in the foundry will deter the artful agent from forcing material upon a firm that did not in every respect measure to the full what it was represented to be, and it is certain that the popularity of many favorite irons would go up with the smoke from the laboratory when a test in the latter sanctum had revealed their marked deficiencies.

Fracture will no longer be relied upon, as it is now a well authenticated fact that analysis has shown that very many of the No. 1 irons are inferior to No. 2 of other brands which may be purchased for less money, saving, in many instances, from 50 cents to \$1.50 per ton.

There can be no question as to how some of our foremost firms are producing castings for such low figures at this time. To my personal knowledge, analysis of the materials employed is at the bottom of it, for by reason of the knowledge thus obtained they have been enabled to purchase both pig iron and scrap at ridiculously low figures, very much of which, under the old rule of thumb methods, would have been rejected as unfit for the purpose. In many instances this decided advantage has been further supplemented by the production of better castings.

It is certain that those who buy on analysis, knowing what they want, monopolize every opportunity for grabbing whatever offers cheap, as the chances for future disappointment are reduced to a minimum by the substitution for the old unsafe method of one that is not only cheap, but sure.

There is practically no difficulty in producing steel of any desired quality, owing to the fact that the different elements are now so well known and may, by chemical test, be regulated in such proportions as will result in the quality of steel required. To accomplish this without loss and inconvenience, all the material is tested before purchase is made and the user knows exactly what he has bought and can, without fear of mistake, proceed to the manufacture of his product, knowing from the beginning what the end will be. Surely castings, pig iron and scrap can be analyzed with as great nicety, so that when fault is found with the resultant castings the true cause of the trouble may be located, the mixture changed to the requisite proportions, and thus control the business as effectually as is now done for steel. In framing mixtures for cast iron, it must naturally occur to the least observant that if a certain proportion of the elements contained in the iron produce certain

chemical effects, which, in turn are productive of certain physical properties, which may be altered according to the proportions employed, we are forced to the conclusion that chemical analysis will reveal whatever is lacking and will also suggest a remedy.

A defect in some pump castings resulted in an analysis of the iron being made by Mr. Molin, who found that it was too high in graphitic and correspondingly low in combined carbon, which caused a soft, porous iron that would dissolve rapidly in the water from the mine. This discovery led to an immediate change in the mixture, an additional quantity of combined carbon effecting at once what under the old régime would not have been satisfactorily accomplished until the offending stock had been all used up and a change brought about, perhaps, by a new consignment. The latter alternative is, unfortunately, the only means of escape possible for numbers of foundries to-day all over. Desiring to learn more in reference to the above, I waited upon the superintendent of the firm, who informed me that an elaborate system of physical tests was the order of the day, and that unremitting attention was paid to this department, but he was now firmly persuaded that unless this was accompanied by chemical analysis they would always be subject to a like experience.

Personally, I may state that since I became satisfied in reference to the wonderful property of silicon to change white and intermediate grades of irons more or less high in combined carbon into graphitic iron, I have experienced no difficulty whatever in arranging my mixtures, simply because a physical test informs me of its strength, and if the shrinkage is found too high it is evidence of hardness, which latter condition I now know may be lessened by an increase of silicon, the shrinkage always decreasing in proportion as the iron becomes more graphitic.

It is not supposed that the common run of small foundries will employ a chemist, but if it be found in the long run that the system of analysis pays there is no question but that they too will contrive some means for obtaining these valuable aids. For instance, proprietors' sons who have hitherto been satisfied with the regular routine of office work will now have their ordinary course of education supplemented by a course in metallurgical chemistry, and thus qualify themselves for the position of chemist, as well as clerk.

A chemist lately said that the reason of foundrymen remaining in the blindfold state they are is simply their ignorance of the fine elements which determine the quality of their castings, and furthermore, that this knowledge can be easily obtained by any intelligent clerk, who may then, with an outfit costing about \$200, proceed to make tests for these elements as satisfactorily as any chemist.

One thing, however, is certain, our young men are gradually awakening to the advantages open for students in the technical schools, and, as chemistry is taught at most of them, we may expect in the near future to see our benevolent employers rendering substantial aid to their apprentices, in order that they may be qualified for the important duty of making an analysis.

Why is it that our technical schools stand aloof from this all important question? Is this, like everything else pertaining to the foundry, to be tabooed also? Have molders and founders no rights that these institutions feel bound

to respect? Surely the day is now past when a foundryman is to be spurned because of the apparent griminess of the business. I think the advent of chemistry in the foundry will mark a new era in the history of foundrymen; hitherto the faculty have shunned them on account of their surroundings; but the rays of science have penetrated the dark molding shop at last and her votaries hasten to undo the errors of the past, because, discerning the numerous problems that remain as yet unsolved, they have finally cast prejudice aside and are now walking hand in hand, the more practical molder being guided by the scientist in paths that harmonize with physical law.

Your true man of science now acknowledges freely that the foundryman is deserving of more than ordinary credit in that so much has hitherto been accomplished by men who were shrouded in such a dark panoply of ignorance.

It is to the truly great among these men of science that the future founder must look for enfranchisement. Let furnaces and the necessary equipment for the smelting of ores, metals, alloys, &c., be at once erected in our technical schools, where our aspiring youth may be taught experimentally how to eliminate the objectionable elements from metals, also to determine by analysis of materials, including fuel, slags, ores, fluxes, &c., what their natures consist of and thus qualify themselves for the very excellent change in their position which to me seems inevitable in the near future.

Discussion.

Mr. MacKenzie: My own experience of four or five years in the Illinois Steel Works, where every piece of material coming in and going out was subjected to analysis, makes me think that it would be of benefit to the foundryman as well. On one occasion in the making of miter steel castings for valves, that has come to my experience, the addition of 0.25 per cent. of silicon obviated all the difficulty that the foundry was experiencing in making the castings. Their castings were perfectly satisfactory except that they did not do the work they were called upon to do. They leaked steam and even water right through the body of the metal. We found by changing the mixture in the cupola we had a good sound casting and it did the work well that it was called upon to do. The persons that employed us seem to think they have solved the problem. We analyzed the castings which were defective and suggested the addition of silicon and a few other practical methods of treating the metal after it was melted and then it did the work.

Mr. Moore: May I ask if the trouble was in pipe fittings?

Mr. MacKenzie: Yes, sir.

Mr. Moore: Was the trouble where there was a joint?

Mr. MacKenzie: No, it was right through the body of the casting. The casting was porous and the pressure pushed it right through.

Mr. Beckwith: I want to say in regard to finding that a No. 2 iron of some brands works better than a No. 1 of some other brands, that we have noticed that also. We have bought a strong iron with a beautiful fracture and could not use it at all. We have used No. 2 and No. 3 iron that would be better than this No. 1. If you were buying iron on fracture you would buy that every time. No. 2 and No. 3 had a close fracture, not so fine to look at, but made a better iron.

Mr. Fenner (to Mr. MacKenzie): I would like to ask what suggested to the gentleman the use of more silicon.

Mr. MacKenzie: We found that high silicon steel lies quieter in the molds.

Mr. Fenner: My experience is that addition of silicon to the iron makes it more open. I do not know how it would be with steel.

Mr. MacKenzie: You have a great deal more carbon in the iron to change to graphitic. In steel you have very little carbon. Iron may contain from 2 to 3 per cent., and steel may contain only 0.01 per cent. Soft steel with low silicon is very hard to keep quiet. It is very porous.

Mr. Fenner: If it was iron you would have reduced the silicon instead of adding it?

Mr. MacKenzie: Yes.

Mr. Moore: The paper testifies to my belief of the value of the laboratory as an aid to the foundry. I am certain of it. Speaking of the use of No. 2 iron—that is, of a higher grade iron being of less value than a lower grade iron—I have some analyses here of some Southern irons, which may be interesting:

	No. 1 foundry.	No. 2 foundry.	No. 3 foundry.
Silicon.....	3.1	2.5	2.3
Sulphur....	0.68	0.005	0.008
Soft iron.			
	No. 2.	Gray forge.	
Silicon	3.5	2	
Sulphur.....	0.009	None.	

I have also three other analyses:

	No. 1 soft.	No. 2 soft.	No. 3 foundry.
Silicon.....	2.69	2.76	2.9
Sulphur....	0.013	0.016	0.022

Now if silicon means anything in iron it means that their No. 3 iron is softer than the No. 1, for although there was a difference of perhaps 0.8 per cent. in silicon in favor of No. 1, it contained nearly ten times as much sulphur. Now comparing the No. 3 with No. 2 soft, we have about 1 per cent. additional silicon, but exactly the same sulphur. Again, comparing their No. 2 soft with the No. 1 foundry, we find that there is no very great difference in the silicon—three and one-half against three and one-tenth—but the No. 1 foundry contains eight times as much sulphur. I believe, and I am willing to buy iron on that belief, that if I pay 5 cents more a ton for No. 1 soft than I do for No. 2 soft—I do not care what the fracture of the iron is—that I am paying just the 5 cents too much. You will see from the last analysis that the No. 3 foundry contains more silicon than either No. 1 or No. 2 soft and there is no appreciable difference in sulphur. It runs higher in silicon by 0.14 per cent. than the No. 2 soft. I am satisfied that the No. 3 foundry having that analysis will be just as strong when remelted as the No. 1 or No. 2 soft; even a little stronger, because it has a little more silicon in it. The more experience I have the more confidence I have in buying iron on analysis. We are confined to a certain line of work. Our experience would probably not be of value to any others and if we were called upon to make a cylinder or a car wheel we would not feel as though we could rely upon our own knowledge. For the purpose for which we use iron—stove castings—we feel reasonably safe to buy upon analyses.

Mr. Vrooman: In Mr. Bolland's article I think he speaks of the fuel, sand and fire brick. Very few foundries make analyses of their sand. It is more a question of price than anything else.

Does not the sand absorb the impurities from the water, blacking, &c., and does not the iron take up these from the sand? I think that in depending upon the analysis of iron alone we make a mistake.

Mr. MacKenzie: I quite agree with the gentleman that there may be a large number of impurities in the sand as commonly used. We used to pay a great deal of attention to our vessel lining sands. I presume the same thing would be necessary in molding sand.

Mr. Vrooman: Does not the sand absorb the impurities that come from these sources?

Mr. MacKenzie: Yes, undoubtedly the properties of the water on evaporation remain in the sand.

Mr. Vrooman: Could there be enough of this to have any effect on the iron?

Mr. MacKenzie: Not materially. After a time it might. Impurities in water, while large, looked upon as impure water, would be small after the evaporation. As time went on they would, of course, accumulate.

Mr. Fenner: It has a great effect upon the iron in the cupola. Whether the iron absorbs the silicon from the molds I have never tried to demonstrate.

Mr. MacKenzie: I do not think the iron would absorb any silicon from the sand in the molds. You have got to have a certain temperature to make the combination possible and you do not get to that temperature in molding.

Mr. Vrooman: I mean the impurities the sand would absorb from the plumbago, carbon, &c.

Mr. Fenner: I would say that the iron being chilled would not absorb any carbon.

Mr. Moore: Cast iron is reasonably saturated with carbon. Is it possible to absorb more carbon?

Mr. Vrooman: It does not absorb the carbon. Does the sand absorb the impurities? That is the question. If the sand absorbs the impurities, does the iron take them from the sand? Mr. MacKenzie said that the water would in time take up the impurities.

Mr. MacKenzie: You must understand I spoke of the theory. The theory is that in the course of time these impurities would accumulate. I know the impurities are very minute.

Mr. Moore: The suggestion of the action of water upon sand has occurred to me, because we have for a great many years been using water which is highly charged with lime and the thought has occurred whether or not the constant use of the lime water is not affecting the sand. Whether or not it is I really don't know, but I think that the suggestion is one that is worthy of consideration and it is quite possible that the use of water that is highly charged with lime, sulphur and other things might be injurious.

Mr. Fenner: Do you not think that lime injures iron?

Mr. Moore: I have never seen anything to indicate that.

Mr. Beckwith: We made a series of experiments in lime and were not able to see any particular difference either in the strength or the softness of the bar.

Mr. Fenner: If it does not injure iron why does it injure water?

Mr. Moore: My suggestion was that it injured the sand.

Mr. Vrooman: The lime is used as a flux, and I should think the lime flows off with the slag and is not melted. It does not come in contact with the iron.

Mr. Beckwith: In charging lime for

the flux we would charge it on the iron as it is melting. It collects the dirt from the iron and flows off.

Mr. MacKenzie: Lime does not combine with the metallic iron at any time. It forms a silicate of iron which goes off as slag.

Mr. Fenner: Has any one ever had any experience with high silicon iron cutting furnace lining any faster than iron with low silicon?

Mr. Moore: We never observed any difference. We only make small castings, and iron which is fairly high in silicon. At the same time our lining lasts about as long as that of any foundry that uses a mixture of 1 per cent., or more than that, less in silicon than ours.

Mr. Fenner: I have found where we use the iron high in silicon it cuts the lining out.

Mr. Moore: I don't see why.

Mr. Fenner: It forms an acid.

Mr. Moore: I don't see why the presence of the silicon in the iron should affect the silicon in the lining. Do you reduce your silicon much in the high silicon iron.

Mr. Fenner: I use it more for taking up slag.

Mr. MacKenzie: Do you get a very black slag?

Mr. Fenner: Yes, it is heavy.

Mr. MacKenzie: It forms a silicate of iron with the oxide of the scrap, which combines with the silicon.

Mr. Fenner: My experience has been that there is much more to be gained by using low grade irons than by working high grade irons. I do not get as good results in high grade irons as I do in low grade irons.

Mr. Moore: There may be a great deal of truth in the statement in the paper read that when all foundrymen can intelligently adjust their purchases to their wants as determined by analysis, some of the furnaces will find their peacocks are nothing but common fowls.

Mr. Gardner: How do most of the furnaces grade their iron, by fracture or chemical analysis?

Mr. MacKenzie: Foundry iron by fracture; Bessemer by analysis.

Mr. Gardner: Some of them give a chemist's card with every car.

Mr. MacKenzie: There are analyses made of all casts. Some purchasers do not care for the analysis and buy from their experience by the fracture. They see an iron that suits and they buy it.

Mr. Vrooman: Do test bars under the same heat break at the same pressure? Does it not always take three to get an average?

Mr. MacKenzie: I think it does.

Mr. Vrooman: Do they always run the same? Do they not always vary?

Mr. MacKenzie: Yes, they always vary somewhat. You never get two samples of anything that are exactly alike.

Mr. Moore: In blast furnace products is there any uniformity in the castings in the different parts of the head?

Mr. MacKenzie: The flux running hot reduces more silicate to silicon and the slag takes off more of the sulphur and generally there is more silicon than sulphur at the latter part of the heat.

Mr. Moore: But as the iron lies before it is tapped you have a mass of metal which is permeated with the sulphur?

Mr. MacKenzie: The temperature at the time of the iron being formed is the temperature which would apply to each cast. After the iron has been made and is lying in the bottom of the flux it does not go through much change.

Mr. Moore: The condition at the end of the cast must be the same as at the time the iron is being tapped.

Mr. MacKenzie: Yes, sir.

advantages offered by the Bellingham Bay cities as a location for an iron plant. He said it was the intention of the company he represents to establish a \$50,-

to the large deposits of bog iron ore on Tuxada Island and to the Cherry Creek mines in British Columbia, as well as the large deposits up the Skagit River. And what is scarcely less important, it is convenient to fine coking coal and possesses good transportation facilities.

The Robinson Coal Washer.

In their efforts to improve furnace practice and cheapen cost, the Alabama and Tennessee iron manufacturers have turned their attention to bettering the quality of their coke by washing the coal from which it is made. Some years since H. S. Chamberlain and A. M. Shook investigated in England the coal washer invented by Robert Robinson of Howlish Hall, near Bishop Auckland, and introduced it into this country. Since then it has been adopted by a number of concerns, the Robinson Patent Coal Washing Machine Company of Chattanooga having put in two machines for the Sloss Iron & Steel Company who are adding two more. The Tennessee Coal, Iron & Railway Company have four machines in operation, and the Mary Lee Coal & Railway Company and the Cahaba Coal Mining Company each one. In addition to these plants which are all in the Birmingham, Ala., district, there are in operation one at Rockwood, Tenn., for the Roane Iron Company; one at Rathburn, Tenn., for the New Soddy

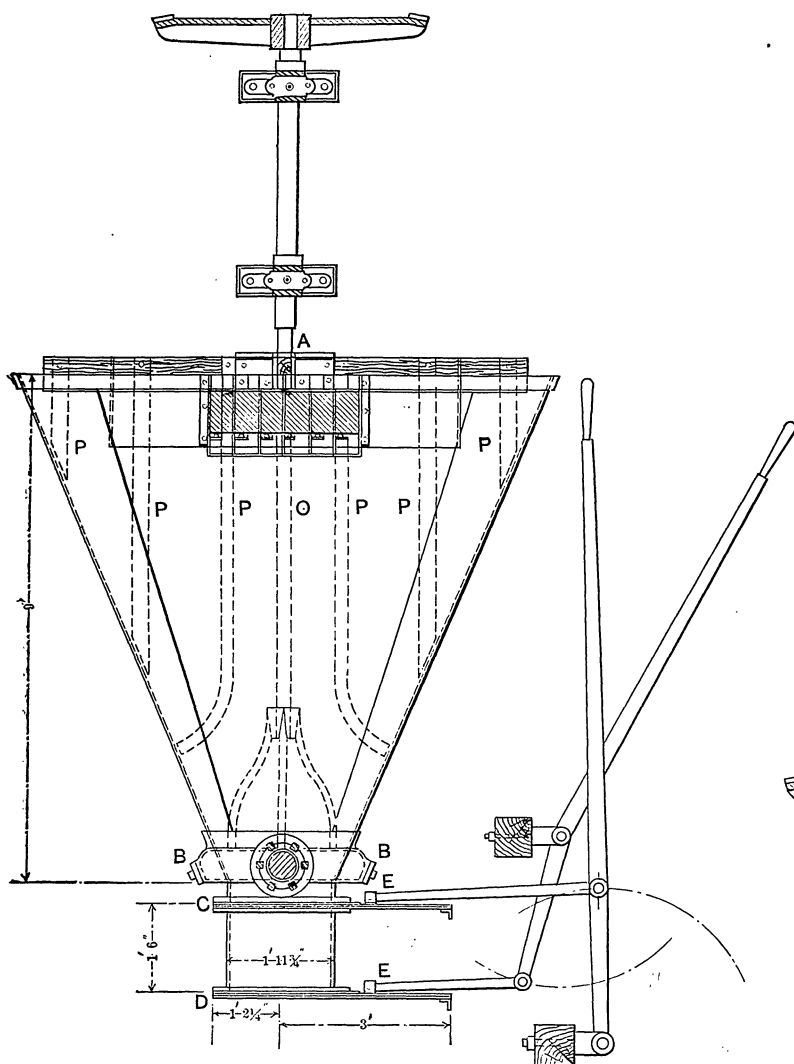


Fig. 1.—Side Elevation.

THE ROBINSON COAL WASHER.

Mr. Vrooman: I would like to ask if there is any difference in the bar whether it is poured with hot iron or with cold iron. When it chills down to the color of an orange or when it is white.

Mr. MacKenzie: I am unable to answer that question. I have not had any experience in that particular line.

Mr. Beckwith: I do not think there would be any particular difference. I have tried it both ways.

Mr. MacKenzie: Referring to the change in the quality of the metal, of course one refers to a furnace that is working uniformly. A furnace that is working off would change the iron entirely. You can see when it is poured out whether it has changed from the hot to the cold line.

A vote of thanks was then unanimously extended to Messrs. E. A. Wheeler and Simpson Bolland for the excellent and interesting papers they had presented to the association, after which the meeting adjourned.

A press dispatch from Whatcom, Wash., states that Charles S. Wallace of New Castle, Pa., secretary and treasurer of the New Castle & Shenango Railway, and assistant manager of the G. W. Johnson Iron Works, visited that locality investigating the ad-

000 plant at the outset and utilize scrap iron in the operation of the plant until business justifies the erection of a blast furnace. Bellingham Bay is convenient

Coal Company; one at Coal City, Ga., for the Georgia Mining, Mfg. & Investment Company; one at Pioneer, Tenn., for the Buckeye Coal Company, and one

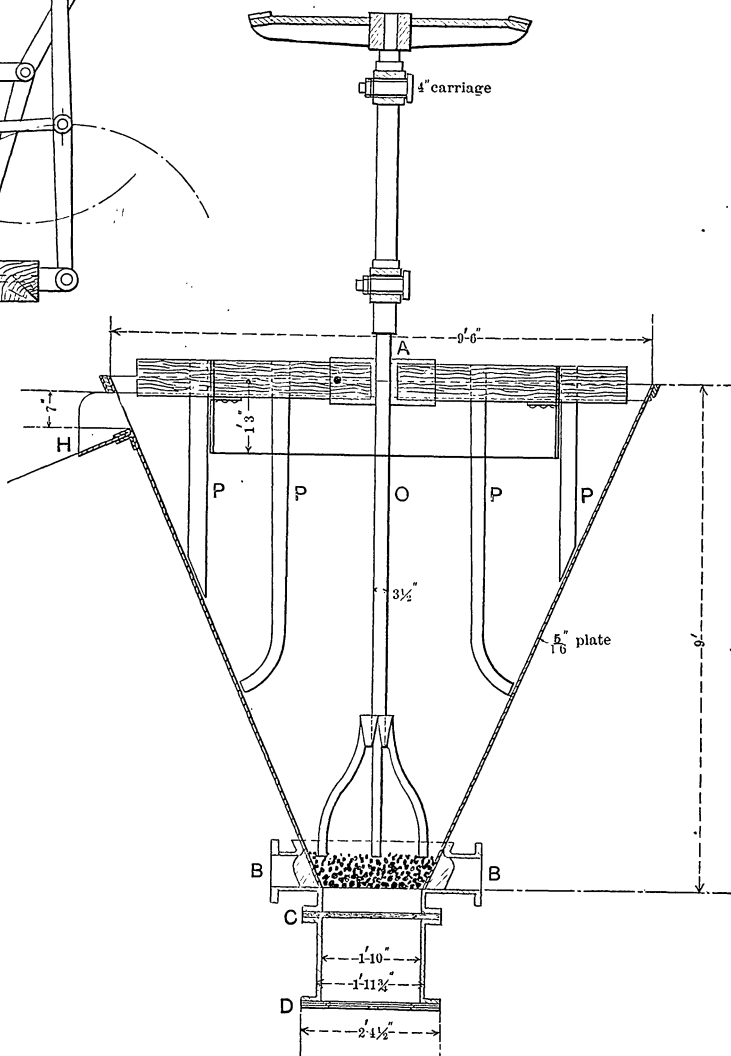


Fig. 2.—End Elevation.

at Coxville, Ind., for the Brazil Block Coal Company.

A 300-ton Robinson coal washer is shown in Figs. 1 and 2, the principal dimensions being given in the engravings. The machine consists of an inverted plate iron cone, having at its lower pointed end a water jacket, to which are connected at B water pipes, ending in eight rows of $\frac{1}{4}$ -inch holes $1\frac{1}{2}$ inches from center to center. In the engraving these holes are somewhat indistinctly shown. Through them water is delivered in such volume and at such pressure that the upward flow carries off the lighter particles of coal over the chute H, Fig 2, while the heavier slate settles down to the bottom of the cone.

is the slate chamber from which the refuse falls directly into the car M. It will be observed that the apparatus is exceedingly simple. We are advised that the results obtained are very satisfactory, and that the cost of washing is low.

Test of United States Dredge "Ram"

The "Ram" is a powerful self-propelling suction dredge built by the Bucyrus Steam Shovel & Dredge Company of South Milwaukee, Wis., for the Mississippi River Commission, fourth district. A part of the contract

vision of Capt. John Millis on the part of the Government and A. W. Robinson on the part of the builders.

The volume of discharge was measured by diverting the stream into water tight bins upon a large flat scow, fitted with suitable sluices and gates. Samples of the discharge were taken in this way for periods of 30 seconds every half hour during the test. At the conclusion of the test the contents of the bins were allowed to settle undisturbed for 40 hours, and the contents accurately measured. Then the water was drawn off and the residue measured. This residue was found to consist of semi-fluid mud on top and solid material in the bottom, and was therefore

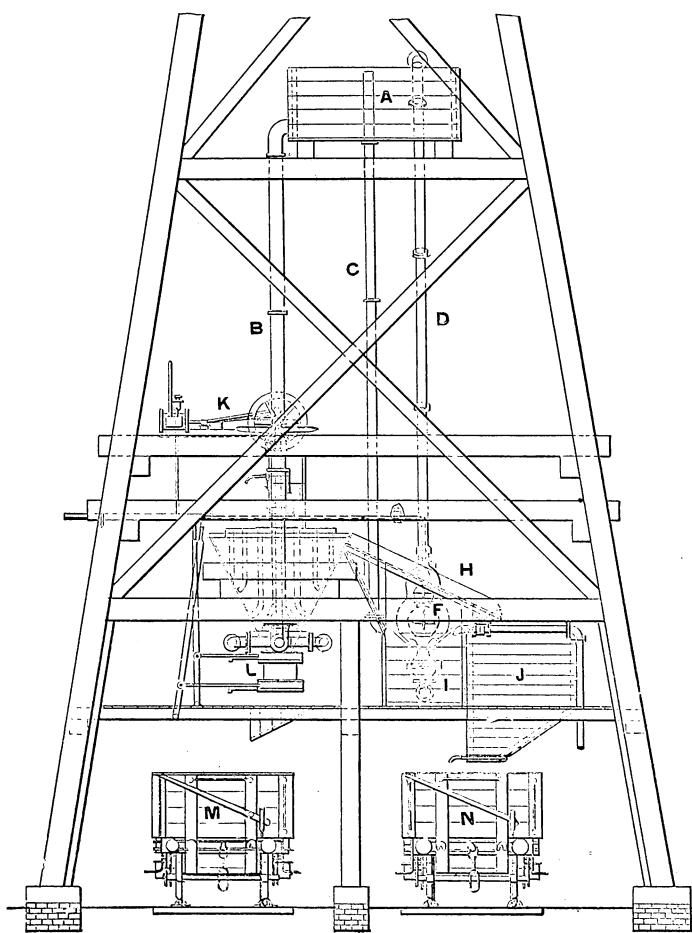


Fig. 3.—Front Elevation.

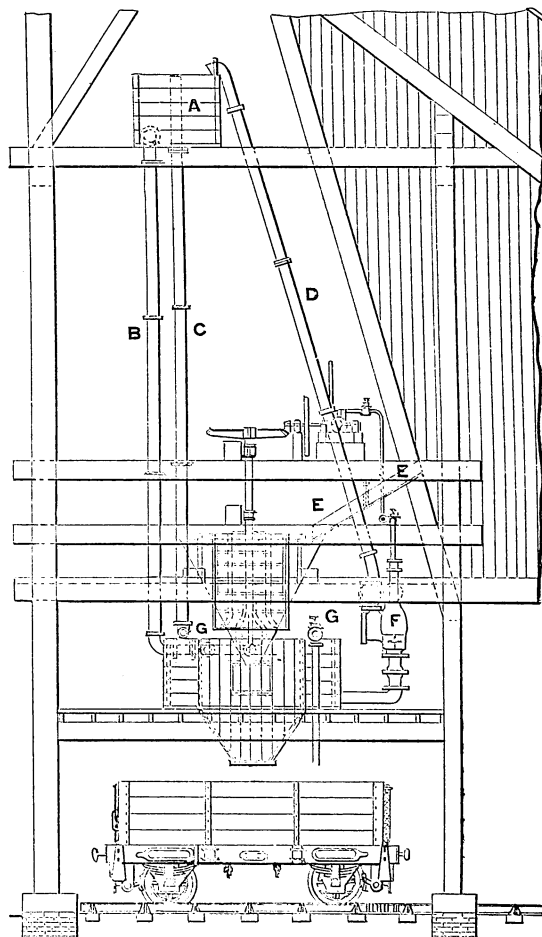


Fig. 4.—Side Elevation.

200-TON ROBINSON COAL WASHER AT THE WESTERTON COLLIERY.

The slides C and D are so arranged that the impurities may be withdrawn from time to time without stopping the machine or interfering with the washing. The separation of coal and slate is aided by agitation produced by rotating the arms P P, Figs. 1 and 2, on the shaft O.

The general arrangement of the plant is illustrated by Figs. 3 and 4, which represent a 200-ton washer at the Westerton Colliery of Bolckow, Vaughan & Co. The water is delivered to the washer from the cistern A through the supply pipe B. The water is delivered with the aid of the pulsometer F, C being an overflow pipe. The coal to be washed is delivered to the washer by the spout E, Fig. 4, and the washed product goes over the perforated spout H to the bins J. I is a water cistern into which the water from the washer drains and from which it is drawn for repeated use. The engine K drives the washer. G are regulating valves, and L

requirements were as follows: "Practical capacity to be not less than 300 cubic yards of solid matter per hour when discharging over a bar or bank not less than 10 feet above water surface and with point of discharge not less than 300 feet distant. The dredge must be capable of working effectively in stiff clay and sand. It must be capable of cutting its own way through a solid bank above water. It must be able to work in all depths down to 30 feet. It must be able to discharge the material on either side to a distance of 1000 feet, and over a bank 35 feet elevation above bottom of cut. It must admit of easy and rapid handling in a narrow channel in shoal water and in a rapid current."

The dredge was built on the Ohio River and proceeded to its destination in Louisiana under its own steam, making a speed of 7 miles per hour, to wing 11 pontoons. The test for capacity took place on January 29, under super-

measured separately, with results as follows:

Duration of measure trial, hours.....	3
Total time pumping into scow, minutes.....	3
Total measured volume, cubic yards.....	16.87
Volume of residue after settling 40 hours, cubic yards.....	38.37
Percentage residue, total volume.....	54
Rate of discharge of residue, cubic yards per hour.....	777
Volume of semi fluid mud drawn off after 40 hours, cubic yards.....	16.37
Volume of solid matter left, cubic yards.....	22
Semi-fluid mud reduced to solid material, cubic yards.....	9.82
Total solid material discharged in three minutes, cubic yards.....	31.82
Percentage of above to total volume	45
Rate of discharge of solid material, cubic yards per hour.....	636.4

The dredge was making a cut 100 feet wide and 14 feet deep, discharging 10 feet 6 inches above the water at the prescribed distance, and the result was

more than double the guarantee. This large output was obtained steadily, and no attempt was made to sort the material. In this dredge the material is excavated and fed uniformly and continuously to the pump by a rotary steel cutter head, so that the pump and pipe is worked up to its maximum capacity, and the percentage of solid matter is under control. The dredge was built from the designs of A. W. Robinson, the chief engineer of the Bucyrus Company.

The Finished Iron Market of Canada.

Bars—Nails—Rods.

The iron and steel rolling mills of Canada are more numerous than the blast furnaces and are also more widely distributed than the latter. Two new mills have been erected since 1891, one at Montreal and one near Toronto, the total number now being 14, operated by 11 companies. Three of the mills are in Nova Scotia, two in New Brunswick, five in Quebec and four in Ontario. All are reported more or less active at the present time, except two in Nova Scotia, one of which has been idle for years. The chief products of the Canadian mills are merchant and other bar iron and nail plate. The New Brunswick mills, both situated at St. John or in its neighborhood, also roll mine rails and are provided with machinery for producing ship and railway spikes, bridge bolts, car axles, fish plates and knees for ships. The Quebec mills are all in Montreal or its suburbs. One of them was erected in 1892 by the Grand Trunk Railway Company for the purpose of rolling bars and angle iron from old iron rails wholly for the use of the railroad. The other Quebec mills, besides bars and nail plate, manufacture cut nails, horseshoes, horseshoe nails, railroad spikes, bolts and nuts and one produces skelp iron. Two of the Ontario mills are situated at Hamilton and two in the vicinity of Toronto, one of the latter having been recently erected and equipped with machinery brought from the United States. In addition to large quantities of bar iron, one or two of the Ontario mills also produce band iron and steel, forgings, fish plates, rivets and washers, besides nail plate for the cut nail factory attached to one of the Hamilton establishments. There is only one establishment in Canada where crude steel is produced. This is an open hearth plant situated at New Glasgow, Nova Scotia. Most of the steel turned out is used by the company in their varied products, which, in iron and steel, consist of merchant bars, forgings, car axles, mine rails and material for agricultural implements. This plant turns out about 100 tons of finished products per day when in full operation. The total annual capacity of the Dominion rolling mills in finished products is about 130,000 long tons. The actual production, however, of any one leading article, except nails, is not ascertained.

It will be seen from the above statement that Canadians have thus far limited their energies to producing the simpler forms of rolled iron and steel. They manufacture no steel rails, no wire rods, no boiler or other plates, no sheets, nor any structural shapes, and only one company roll skelp iron. Their raw material is obtained in the cheapest form, viz.: scrap iron, on which the duty is but \$2 a short ton.

Consequently there is little encouragement to engage in the manufacture of muck bar, and none of the few puddling furnaces are now operated. Only one establishment uses much muck bar, the Montreal Rolling Mills Company, who import it for the manufacture of skelp. The total quantity imported in the fiscal year 1892 was 3220 short tons; in the calendar year 1892, 3141 tons, and in the calendar year 1893, 2599 tons. The entire quantity came from Great Britain. The average British value per long ton in 1893 was \$20 25, which is about 75 cents above the present Pittsburgh price.

The capacity of the existing Canadian mills is ample to supply the domestic demand for ordinary qualities and sizes of bar iron, but considerable quantities of particularly large or particularly small sizes and of the finer qualities of bars are imported from Great Britain. The total quantity imported in the fiscal year 1892 was 6668 short tons, valued at \$231,468, and in 1893, 5017 tons, valued at \$174,354, the United States supplying only 581 tons, valued at \$27,578, in 1892 and 678 tons, valued at \$28,586, in 1893. Of course these importations include the bar iron of all grades brought in at British Columbia, a market which mills in the eastern part of Canada cannot be expected to monopolize even with the \$13 per short ton duty. The total quantity of bars imported at Montreal in the calendar year 1892 was 2614 short tons, valued at \$94,943, and in 1893, 1887 tons, valued at \$70,172. The United States sent 52 tons, valued at \$2487, in 1892 and 59 tons, valued at \$2244, in 1893. The importations entered in Ontario were not so large, the quantity for the whole province in the third quarter of 1893 being only 198 tons, valued at \$6609, the United States supplying 54 tons at \$1817. These quantities are much less than the imports in the third quarter of 1892. Of course, much of the iron entered at Montreal finds its way into Ontario and elsewhere.

The bar iron market, as represented by the above importations, is not a large one. Its enlargement for the foreign manufacturer means successful competition in ordinary grades and sizes with the Canadian mills using scrap and with the British maker of finer qualities and extraordinary sizes. The present quotation in Montreal and Toronto for jobbing lots of ordinary bar is \$1.85 per 100 pounds, f.o.b. Taking the lowest American quotation for good sized orders of common iron, \$1.05 at Pittsburgh mills, and adding the duty of 65 cents per 100 pounds, makes \$1.70, which would not leave sufficient margin to pay freights from Pennsylvania points. British iron is quoted at Montreal at \$2.25 and the famous Low Moor bars at \$5.25. In competition with the latter, especially, not only would a temptingly lower price be necessary, but also unassailable proofs of quality.

Besides bar iron the other principal product of Canadian mills is the cut nail. The prospects of successful foreign competition with the domestic article are small. In the first place, the capacity of the Canadian factories is sufficient to supply the demand, and consequently the importations of cut nails have been unimportant in quantity. The annual consumption of nails in Canada, if in the same proportion as during an active year in the United States, should be about 700,000 kegs, the latter country having made over 9,000,000 kegs of cut and wire nails together in each of the years 1891 and

1892, and its exports being merely nominal. The Dominion, however, has not yet made nearly 700,000 kegs in any one year. The production of cut nails in 1893 was about 400,000 kegs. The wire nail makers are very reticent about anything concerning their product, but it is intimated that the number of kegs of wire nails made was not equal to one-third that of cut nails.

Cut nails in Canada are made from old steel rails as well as from iron scrap, but not nearly so large a proportion are cut from steel as in the United States, where about four-fifths of the cut nail production is of steel. Both the cut and the wire nail are graded the same as in the United States, the 60-penny being the base. The base price for carload lots of cut nails is \$2.25 per keg, increasing up to \$3.75 per keg for 2-penny. These prices are generally adhered to, slight concessions being made on particularly desirable orders. Steel nails, nominally, are 10 cents per keg higher. Four months' time is allowed, or 3 per cent. for cash. Both cut nail and wire nail prices are regulated by associations of the manufacturers, who impose their own terms on the dealers. Many dealers are, however, becoming restive, and, in view of a probable lowering of the tariff on nails, are carefully considering the extremely low American quotations. The duty on cut nails is now 1 cent per pound, or \$1 per keg. Adding this duty to the lowest base quotation for carload lots of the usual average in the Wheeling district, \$1, makes \$2, and the freight to Montreal would then make the laid down cost very nearly the same as the local quotations. Under the present duty there is no encouragement for the Canadian dealer to buy across the line, as the association could easily undersell him. A cut in the tariff rate, however, would develop an interesting situation between manufacturers and importers.

A similar condition of affairs obtains in the wire nail trade. Although the production is less, the number of factories is greater than in the cut nail industry. There are two wire nail factories at St. John, N. B., seven with headquarters at Montreal (three operated in connection with cut nail factories and one by the Grand Trunk Railway Company), one at Gananoque, Ont., two at Toronto and vicinity and one at Winnipeg, Manitoba. All except the Grand Trunk factory (which manufacture only for the use of the railway company) belong to the Wire Nail Association. The list price of wire nails f.o.b. cars at all the above points except Winnipeg is \$12 per keg for 60-penny No. 3 gauge, up to \$24 for 2 penny, No. 16. The present discounts are 75 and 5 per cent., which would make the base price \$2.85 per keg, f.o.b., time allowance or cash discount the same as for cut nails. The duty on wire nails is 1½ cents a pound, or \$1.50 a keg. This added to the Pittsburgh quotation of \$1.05 for 1000-keg lots makes \$2.55, which, without considering minor discounts on either side, leaves an apparent margin of 30 cents with which to pay freight, &c., to Canadian points. Under ordinary conditions of trade this margin would be sufficient to encourage importations at favorably situated ports. But the dealer who should take advantage of the situation would soon find his competitors who held to the association's conditions sanctioned to undersell him, besides losing rebates on association goods which otherwise would be due to him. The outlook under the present tariff is not favorable to an ex-

pansion of the United States export trade in nails northward. The uncertainty concerning the changes which will be made in the Canadian tariff by the Parliament which opens on the 15th inst. is meanwhile having an injurious effect on the business of both the manufacturer and importer in Canada.

In other leading rolling mill products than those mentioned the American exporter who may be interested in his Canadian neighbor will have only to consider his European competitor for that neighbor's favor. There is necessarily a large importation of wire rods into Canada, the quantity entered in the fiscal year 1892 being 11,226 short tons, valued at \$461,156, of which only

The Forbes Die Stock.

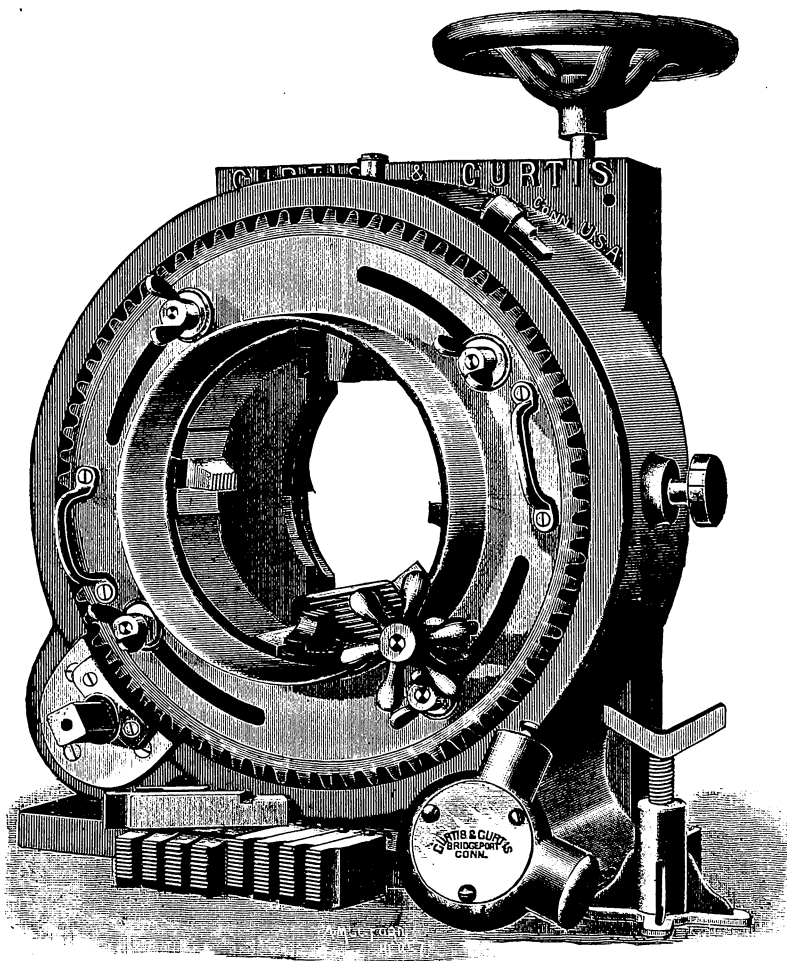
Curtis & Curtis of Bridgeport, Conn., have recently brought out a new development of the Forbes patent die stock. The cut shows a front view of a machine called, for purposes of identification, a No. 3 C hand machine, and it both cuts off and threads all sizes of wrought iron pipe from 2½ to 6 inches. As this machine weighs only 325 pounds it is easily portable from place to place and the work done on the spot, without the trouble and expense of carting the pipe to the shop and cutting it to measurement. In operating this machine the pipe to be cut is

chines made by this firm, a turn of the knob, shown on the side of the machine, releases the lead screw, the dies are thrown back, the gear is pulled forward and all is ready for new work.

Cleaning Castings With the Sand Blast.

The principle of using sand as an abrasive by propelling it through a blast at high speed, which was invented by J. C. Tilghman of Philadelphia, has been used for some years in England by the Tilghman's Patent Sand Blast Company, Limited, at Sheffield, for the removal of molding sand, scale, &c., from steel, iron and brass castings, forgings, plates, and also for cleaning the stone work of public buildings. For propelling the sand compressed air at from 8 to 10 pounds pressure per square inch is employed. Chilled iron globules instead of quartz or flint sand are used with good results, both as to speed of working and cost of material, when the operation can be carried on under proper conditions. With the expenditure of 2 horse-power in compressing air 2 square feet of ordinary scale on the surface of the steel and iron plates can be removed per minute. The surface thus prepared is ready for tinning, galvanizing, plating, bronzing, painting, &c. The innumerable little indentations form an excellent anchorage for the protecting materials, causing them to adhere with much greater force than to an acid or otherwise cleaned surface. The advantage of this method of cleaning castings is that it acts with equal rapidity and thoroughness upon flat, curved, angular and indented surfaces. By continuing the operation the hard skin on the surface of castings, which is so destructive to the cutting edges of milling and other tools, can be removed. Small castings are placed in a sort of slowly rotating barrel open at one or both ends, through which the blast is directed downward against them as they tumble over and over. No portion of the surface escapes the action of the sand. Plain cored work such as valve bodies can be cleaned perfectly both inside and out. One hundredweight of castings can be cleaned in from 10 to 15 minutes with a blast created by 2 horse-power. The same weight of small forgings and stampings can be scaled in from 20 to 30 minutes. We understand that those who have developed the Tilghman process in England contemplate starting a similar business at an early date in Philadelphia, J. S. Mathewson, managing director of the company, having been in the employ of Mr. Tilghman since 1870. We understand that Mr. Mathewson, Mr. Tilghman and his brother, who reside in Philadelphia, are the sole proprietors of the business, which, therefore, seems destined to return to this country after years of development in Great Britain.

The Chicago, Burlington & Quincy Railroad Company have just completed a most important piece of work not only for the interests of that company, but also for St. Louis. It is a new road which runs into that city from a point on the old road about 50 miles north, on the west side of the Mississippi River. It intersects important railroad systems running to the west and southwest, and thus avoids the crossing of the Mississippi River at St. Louis and the delay in getting through the city. Independent terminal facilities have been provided for the road in St. Louis which have long been needed.



THE FORBES DIE STOCK.

750 tons, valued at \$104,884, came from the United States. Brass and copper rods are included in these quantities, which accounts for the high valuation, but, of course, steel rods formed the bulk of the importations from abroad. They are admitted free of duty. Germany has a monopoly of the market at the present time and is evidently prepared to maintain it, as she has the advantage (when navigation is open) of water transportation direct to Canada's principal consuming point for wire rods, Montreal, where a representative of the German manufacturers is stationed. The quotation for German rods laid down at Montreal is \$26.75. Pittsburgh rods at their present low price of \$23.50 could not reach Montreal under \$28. The more limited Toronto market might be captured, although even there a desirable order would not be readily relinquished by the Germans.

placed in the machine from the rear through the self centering vise, which clamps it and brings it central with the dies. The face plate is then turned to the proper graduation for the size of pipe to be cut, which sets the dies at standard size. Any variation of the fitting can here be allowed for, and the pipe cut either over or under standard size, if desired. The reversible ratchet wrench shown in the cut is then placed on the end of the pinion with a piece of pipe in it for a handle, and either by revolving it round like a crank or by ratcheting it like a pump handle the die carrying gear is caused to revolve. On the back of this gear is located a lead screw which causes the gear, as it revolves, to also recede into the shell and the dies are brought on to the pipe. When the thread is cut, instead of being obliged to revolve the gear back again to its original position, as was necessary with the old style of ma-

CORRESPONDENCE.

Foundry Chemistry.

To the Editor: Your report of my paper on the above subject, in your issue of February 15, has called forth a letter from Mr. Molin in yours of March 1. He seems to represent a class of chemists who appear to think that there is no avenue for scientific research except through a chemical laboratory, and all that is done without a chemical formula is "rule of thumb." One who is familiar with metallurgical chemistry, and at the same time a mechanical engineer, will naturally use autographic mechanical methods, especially when he finds that chemical analysis will not account for facts which he must understand.

The specification for cast iron structures is strength, deflection, shrinkage, chill and hardness. These are purely physical qualities, and the engineer does not care about composition so long as the physical quality is satisfactory. Those who say that the physical appearance of pig iron will not indicate its chemical composition, and that it must therefore be sold by analysis, forget that the engineer cannot sell his casting by analysis. Reverse what they say and it is equally true. The chemical composition of cast iron will not at all times indicate its physical properties. Conditions attending the working of the furnace or state of the pig bed will affect the physical quality of the pig iron, and this will be imparted to the casting. It is wise to learn what the iron purchased contains and to keep sulphur low, for its presence indicates that it was made under conditions which will probably influence its physical qualities. It is wise to have a general idea about the silicon content, for the correct amount must be in the casting and if not in the pig it must be added.

Let it be understood that all I say, or have ever said, pertains to ordinary gray iron castings. Makers of car wheels, chilled rolls, malleable iron, or of any special process work, must not think that I will attempt to make suggestions to them.

The right amount of silicon will control the grayness of pig iron or of a casting, and any chemist familiar with foundry iron knows this. Mr. Molin should know that irons that contain higher than 3.50 per cent. silicon are no longer foundry irons, but are vehicles for imparting silicon to other iron.

It seems strange that I should be considered antagonistic to the work of the broad minded chemist. This position would be very ungenerous to such careful analysts as Dr. Mabery and Messrs. Fleming, Orton, Vorse, Morse and Ellis and the chemists of many iron companies for their gratuitous work all along the line of our investigations, and we have little sympathy with the endeavor to show the speed and cheapness of chemical work, such as Mr. Molin says can be learned in a short time by any intelligent office boy or clerk.

Since Mr. Molin quotes some of my written statements to support his statements, let me quote from the November number of the *Foundry* to show my position. "Intelligent mixing of irons cannot be accomplished without the aid of chemistry, and conclusions must be reached by the united work of chemistry and physical experiment.

"We do not by any means wish to be understood as saying one word against chemical analysis. If a man with a

thorough chemical education would learn to look at general tendencies and not hold so closely to four figures of decimals, and accept the result of late research, he could adapt himself to practical foundry work and would be of great use. He would soon leave his laboratory and become the practical leader, and would only go back occasionally to solve some problem that needs new light.

"We cannot have too much respect for chemistry. Practical research could do nothing without it, but after general conclusions are reached then to be of use the chemist must be the practical metallurgist." In the discussion in Philadelphia, Mr. Outerbridge deals practically with one of the most difficult features in foundry practice—viz, the variability in the composition of pig and scrap. He says: "Do not depend upon one, two or three different irons, but make a melt of a considerable number of irons which have been previously analyzed. Now, as soon as you begin to increase the number of irons forming your melt you begin to decrease the possibility of variation." And he might have added, in making a change never change at one time more than one iron in a mixture. This illustrates what we mean by the chemist becoming the practical man. These businesslike ways of avoiding a difficulty are best.

In the latter part of Mr. Molin's communication he happens to step outside of the door of his laboratory, and talks of strength per square inch and expresses the opinion that there need be no more unreliability about cast iron than wrought iron or steel. Perhaps he may find that the mechanical engineer is right, and that an analysis would not keep out slag, or a part of the mold, or prevent a blow hole.

On February 23 the test bars of the iron of the Michigan Stove Company were as follows:

$\frac{1}{2} \times \frac{1}{2} \times 12$ inches.	Dead load.	
	Strength.	Def.
	Pounds.	Inch.
Test bar No. 1.....	530	0.27
Test bar No. 2.....	490	0.26
Test bar No. 3.....	505	0.26
Average three bars.....	508	0.26%

$\frac{1}{2} \times \frac{1}{2} \times 12$ inches.	Impact.		
	Strength.	Def.	Set.
	Pounds.	Inch.	Inch.
Test bar No. 4....	457	0.24	0.02
Test bar No. 5.....	525	0.28	0.03
Average two bars.	491	0.26	0.02

The depth of chill was 0.02 inch or practically none. The shrinkage was 0.131 inch in 1 foot. If a more satisfactory test of gray iron has ever been made, I am not aware of it. The strength of bar No. 1 would figure 4240 pounds per square inch for a bar $1 \times 1 \times 12$ inches.

If chemical analysis will give the explanation for the physical properties of iron with this remarkable strength and low shrinkage, I would like to see it. I report this to ask that those chemists who think that they can formulate a chemical prescription for iron of any physical character may state what the chemical composition of this iron should be. It is made with ordinary coke in

an ordinary cupola, from ordinary cheap foundry pig and one ordinary silicon iron, and to prevent any hesitation on their part, we will add that there is not any aluminum in this mixture.

I understand that at this week's meeting of the Western Foundrymen's Association Mr. Wheeler is to reply to my paper, and I will announce that I will, either at the meeting of the Foundrymen's Association in Philadelphia or in your columns during the first part of April, notice what he and others may say on this subject. W. J. KEEP.

DETROIT, MICH.

Exports of Agricultural Machinery.

In conversation recently with a well-known house handling numerous kinds of agricultural machinery, in large quantities, shipments of which are made to the leading countries of the globe, we were given the following information concerning the localities mentioned below. The general outlook in European countries for agricultural implements of American manufacture is most promising. So far shipments to Russia are far in excess of what they have heretofore ever been known to be. The steamship company which usually dispatches a steamer to Odessa about this time of the year, loaded with this class of goods, owing to the tonnage being doubled has put on an additional steamer. One concern, we are told, has 1500 tons *en route*, while others, they say, have larger quantities. Agents in Southern Russia report trade there the best ever had, resulting from especially large crops last year. Russian dealers are credited with having taken more and quicker notice of our Columbian exhibits of this nature than any others. This conclusion is arrived at largely from actual results so far obtained, judged by orders executed or in hand. Very much of this outcome is attributed to the Russian delegate to Chicago, who was a practical man and made a thorough study of this kind of machinery and promptly disseminated the conclusions arrived at among his countrymen.

Trade in this line with the United Kingdom agents there report as likely to suffer some restriction on account of the severe drought last year, leaving much stock on hand. Drought and financial stress have interfered with trade in Italy and Portugal somewhat, although orders so far from Italy are said to be in excess of last year. Agents in South Africa report trade to be looking up. Droughts there which threatened to be severe have been broken, and farmers are looking forward to good crops. Much damage was expected from the ravages of locusts, but fortunately they have disappeared.

The outlook for the corn crop there is said to be the finest ever had.

In glancing over a little work by C. M. Ryder, on the "Comparative Value of Steel and Iron for Structural Purposes," printed in 1882, he noted that Mr. Cramp, testifying before a commission which was dealing with the question of using steel plates for ship-building, stated that he was paying 3 25 cents per pound for iron ship plate. He noted that he was then giving 7½ cents for Otis boiler plate. The late James Park, Jr., of Pittsburgh testified that steel plates could be contracted for at 5½ to 6 cents a pound. How enormous such figures look in the light of recent events.

The Iron Age

New York, Thursday, March 8, 1894.

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RICHARD R. WILLIAMS, - - HARDWARE EDITOR.
JOHN S. KING, - - - BUSINESS MANAGER.

Waste and Repairs.

It has been pretty thoroughly demonstrated by this time that waste and repairs are very uncertain elements on which to depend for any considerable volume of business. Even a population of 70,000,000 of the most enterprising and usually the most extravagant people on the face of the earth can, when they are forced to economize, cut down consumption in a most disheartening way for those engaged in the business of manufacturing or distributing supplies. The philosophical view of the situation is that in a reasonable time everything in use must wear out or become unfit for further service. Replacements will then be made, causing a fair degree of activity in business circles. But when people are economizing nothing seems to wear out as rapidly as when they have the means to buy freely, and replacements are only made at very long intervals. The United States when prosperous is the best market in the world, and the purchasing power of its people *per capita* is far beyond that of any other country, but the United States when in adversity is perhaps no better than the average European country. Expenses must be contracted within incomes, and if the incomes are light the expenses will be light perforce.

We have heard the manufacturers who depend upon railroad patronage console themselves year after year with the belief that tracks and rolling stock cannot last forever and that a time was coming when renewals must be made on a large scale, the longer they are deferred the larger the requirements. But another year is fast rolling by and still there is no evidence of an unusually heavy demand for repairs. Renewals of track bid fair to be light this year, and old rolling stock will be made to endure the wear and tear of another season. The same thing is true in other directions of public service and in all avenues of private life. The time has not yet come when waste and repairs cut much of a figure in building up a fresh demand. Economy is the order of the day everywhere, and the order is being obeyed by corporations, organizations, firms and individuals as rigorously as if it were a law of the Republic with condign punishment promptly following any infraction.

If the business of the United States should for any reason from this time forth be strictly limited to the actual

necessities of its people there would be no future for the manufacturing establishments now standing idle. Those in operation could easily supply all wants, and perhaps not strain their facilities to meet the requirements of some substantial growth in the population. This is almost an assertion that a large part of the manufacturing and commercial facilities of the country is superfluous, and has been built up far beyond our needs. It would be true if our present condition were normal. But this stringent economy, this greatly restricted consumption, is not the natural condition of Americans. They may be depended upon to work out of it, slowly perhaps, but surely; and the time will come when enterprise will displace timidity, frugality will give way to liberality and consumption will increase in every channel of trade. The masses will then be again well employed, and their earnings will again sustain the fair commercial fabric whose glory is now so sadly clouded.

The Alleged Armor Plate Frauds.

The iron trade has been shocked by the animus displayed by the New York *Tribune* in its attack upon the Carnegie Steel Company in connection with the alleged frauds upon the Navy Department in the delivery of armor plate. Andrew Carnegie and the company with whom his name is coupled do not enjoy much popularity in the iron trade. Their competition has assumed forms which are more than exasperating and are pronounced unfair by their rivals, and Mr. Carnegie himself has made statements in public which are regarded by the majority in the iron trade as uncalled for and injudicious. But we feel that the trade generally will sympathize with the company now. Even though the concern has been made the victim of misguided zeal on the part of subordinates, or has been blackmailed, the responsibility for the attempted frauds rests with it and the settlement with the Government indicates that the officers have frankly accepted it.

We desire above all to protest against the following inference which is a part of the first article printed by the *Tribune*: "If such frauds were capable of being perpetrated upon the Government that had an inspector on the spot, what guarantee would private customers of the company—who had no such privilege—have that they would not be treated similarly?" Such a question is outrageous, because it may do harm by shaking the faith of some buyers who may be as ignorant as the writer of the lines quoted. Every one in the iron trade knows that every consumer of any importance frames specifications based on physical and chemical tests and that any buyer has the privilege of inspecting work in progress or completed. Every one knows that there are a number of concerns who make it their business to serve buyers in the

capacity of inspectors for private work and that the system of inspection on all material for important structures is well nigh universal. Honest, reasonable inspection is welcomed by every steel manufacturer in the country.

Every American manufacturer has been assailed by this attack, so far as it aims to create the impression that attempted fraud upon the Government warrants the inference that less vigilant private consumers are much more subject to underhand practices.

Now, as to the charge that silence was bought by the Carnegie Company at the price of an indorsement of the Wilson bill by Andrew Carnegie. We have been led to believe that the publication of the letter in question was instigated by very different motives. As we understand it, Mr. Carnegie believed, on the eve of his departure, that success would attend an effort being made to modify the bill so far as it related to the metal schedule. We are told that he aimed to secure for himself, by writing the letter in question, the credit for the anticipated success of the movement then undertaken. Besides, the letter was written before the settlement was made. Until now we have an official statement from only one party to the transaction, and that statement is unsatisfactory on the face of it. Judgment should be suspended until the Carnegie Steel Company are officially heard from. Until either the Secretary of the Navy or one of the officials of the steel company confirms the story of blackmail, that version will be put aside as highly improbable.

The trade and the public care very little for the personal interests involved. What is important to every American citizen is that the truth be known, and that, if it is possible, every trace of a taint upon the good fame of American manufacturers be removed. The interests and prestige of our country, coupled as they are with the development of our navy, must suffer from every mysterious scandal. The pride of every patriotic American is hurt through the threat of such a check in our advance to the front rank of makers of armor and of builders of ships. The American people must know the truth.

The results of the investigations of our special correspondent into the chances of marketing much finished iron and steel in Canada are not very encouraging. Even the low figures now quoted as open prices in our most favorable markets do not leave much margin under the most favorable circumstances. As matters stand now only sacrifice sales can capture the business, and there are special circumstances connected with the Canadian trade which make buyers there loath to buy from outside sources, lest they encounter the enmity of Canadian manufacturers. Still, tempting prices must be made in any case to secure a

footing, and it seems a favorable season now to make a drive at the market which is nearest our doors.

OBITUARY.

GEORGE G. LOBDELL.

George G. Lobdell, president of the Lobdell Car Wheel Company of Wilmington, Del., died at his home in that city on the 1st inst. The deceased was born in New York City October 1, 1817, and was therefore in the seventy-seventh year of his age. He began his career as an apprentice to the molder's trade in the foundry of Bonney & Bush, at Wilmington, and while yet serving his apprenticeship was appointed foreman of the shop. In 1838 he succeeded to a partnership in the business, and at once set to work to develop improvements in car wheel manufacture. It is stated that he was the first to produce the double plate convex wheel, which is the standard car wheel of to-day. This invention, only one among many which he has made, was the basis of the great car wheel works of the Lobdell Car Wheel Company. Mr. Lobdell was a public spirited citizen and gave a great deal to charity.

Taking effect Tuesday, March 6, rates on wire and cut nails from Cincinnati and Louisville into the territory of the Southern Steamboat and Railroad Association was reduced 5 cents per 100 pounds. The territory includes Florida, Alabama, Georgia, Tennessee and part of Mississippi. It is stated that this reduction is only preliminary to further reductions in freights to above points, which are expected to be announced within a very short time.

The machine shops of the lumber companies at Menominee, Mich., are now very busy on repair work for the different mills. They are running ten hours a day now and are obliged to employ extra help. The engines and other machinery are receiving more or less repairs, while new pulleys, boxes and other castings have to be fitted, carriage wheels upset and numerous other odd jobs done to place the big mills in readiness for next season's work. The companies have well equipped shops.

Alphonse Hennin, who was for many years chemist and metallurgist of the Springfield Iron Company, but has recently been connected with the Monongahela Furnaces, has been promoted to a much more important position at the National Tube Works, McKeesport, Pa. As metallurgist of this great establishment, Mr. Hennin occupies a position worthy of his talents and his devotion to scientific investigation.

The Youngstown Chamber of Commerce was organized at Youngstown, Ohio, on Monday, February 26, by a number of the leading iron manufacturers, business and professional men of that place. The following officers were elected: M. C. Wick, president; J. H. Fitch, vice-president; G. McKelvey, secretary *pro tem.* and J. Craig Smith, treasurer.

A Minneapolis creditor of a St. Paul real estate firm, which failed some time ago, has received a 1-cent postage stamp in full payment of his claim.

Puddling in the Mahoning Valley.

For some time past the iron manufacturers in the Mahoning Valley have been very much dissatisfied over the fact that they are paying \$4 75 per ton for boiling, while in Pittsburgh the highest price for some time has been \$4 per ton, and in one establishment the rate is \$3.60, and in another \$3.25 per ton. In these times of keen competition the Valley mills have been at considerable disadvantage when bidding for work against Pittsburgh mills, and have lost considerable business by reason of not being able to meet the low prices of competitors. With a view of inducing their puddlers to accept Pittsburgh prices for boiling, and also to relieve as far as possible some of the distress existing in the Mahoning Valley by reason of the enforced idleness of the mills, the following circular letter was sent out last week:

YOUNGSTOWN, OHIO, February 27, 1894.

The deplorable condition that exists among the laboring men in this city was shown at the citizens' meeting at the court house last Saturday evening and is constantly brought to our notice in other ways.

This condition makes the manufacturers feel like making a statement as to what, in their opinion, is the cause of and what may be the remedy for the existing situation in our city, although it may seem to be made from a selfish standpoint.

The business of the Youngstown mills is almost entirely iron, so we feel disposed to hold the puddler largely responsible, because he has refused to meet the conditions that exist. He honestly thought, we have no doubt, that he could not work for the price that would be necessary to compete with steel. By this time he must know that the position taken by the manufacturers was correct and that we could not pay his price and live. This fact has been fully demonstrated, because none of the mills have puddled very much pig iron since we started last November.

It has been further demonstrated by the fact that almost all the puddling now being done in Pittsburgh is done at \$4 or less, in spite of the fact that some of the mills now working at this price last year agreed with the association to pay a higher price, while the mills here have been and are idle because the manufacturers have stood by their agreement.

The remedy now is for all our newspapers to stop the cry of monopoly and cease trying to prejudice the men against their employers. In order that we as manufacturers may get along with our men we must have their confidence.

Then the puddler must meet the conditions that exist and go to work. We should be put on as good a basis as our competitors, at a rate of not over \$4 per ton, and we should be put there at once, if this wretched condition is not to be continued.

We think it would be best to make the rate \$3.50. This makes a large reduction in one year, but the price has been high for several years. At \$3.50 per ton the puddler and his helper can earn about \$4 per day. When they work others must work to tend them, and the consumption of pig iron gives work to the furnacemen. We shall be able to do more work in our finishing mills, and this will benefit the whole town.

While we know there cannot be full work for every iron and steel plant in such times as these, we can then get our proportion. As it is, the steel plants have had the business, and this valley has stood too much of the loss.

THE ANDREWS BROS COMPANY,
THE MAHONING VALLEY IRON CO.,
THE BROWN, BONNELL IRON CO.,
THE UNION IRON & STEEL COMPANY.

As is well known, the Amalgamated Association is a thing of the past, so far as the Pittsburgh mills are concerned, as no concern there is paying over \$4 for puddling, while the scale of the Amalgamated Association fixes the price at \$4.75 per ton. The only strength left to the Amalgamated Association lies in the Mahoning Valley, and unless the officials of the organization see fit to put the Valley mills on an equitable basis with Pittsburgh it is more than probable that within a short time the long list of non-union mills will be still further increased by the addition of the Valley mills. The request for a \$4 rate for puddling is now under consideration by the puddlers. It is understood that some are in favor of accepting, while others are opposed to it. One of the concerns signing the communication printed above can secure an order for 2000 tons of skelp if the \$4 rate is allowed, otherwise the order will likely go to Pittsburgh.

Some bridge engineers are displaying a tendency to specify specially low phosphorus in structural steel, which is telling against the interests of their clients, although they are probably not aware of the fact. By demanding specially low phosphorus they are practically robbing all makers of soft acid open hearth steel of the chance to bid and are thus restricting the number of competitors for the work. Thus a recent specification for a bridge of moderate size called for phosphorus not over 0.04 per cent.; tensile strength, 54,000 to 62,000 pounds; elastic limit, 60 per cent.; elongation not less than 27 per cent. and reduction of area not less than 50 per cent. Now, any maker of acid open hearth steel could easily meet the physical requirements, but would have trouble, or what amounts to the same thing, would find it costly, to keep below 0.04 phosphorus.

Judge Acheson of the United States Circuit Court of Philadelphia has issued a preliminary injunction restraining the Diamond State Iron Company of Wilmington, Del., from using machinery and manufacturing a certain kind of railroad spike, which it is claimed infringe the patent held by William Goldie *et al.* of Pittsburgh, Pa. The injunction has been served upon the Diamond State Iron Company and will prevent that company from manufacturing the spikes or using the machinery until the question of whether the machinery is an infringement of the patent is settled by the courts.

Shipments of 72 tons of side armor for the United States cruiser "Puritan" were made last week to the Brooklyn Navy Yard. This is a part of the lot accepted by the Government after the successful tests made early in February. A shipment was also made of 26 tons of materials for 5 and 12 inch guns to the Washington Navy Yard.

The Government Printing Office has issued the full text of the Wilson Tariff bill as it passed the House of Representatives on February 1, 1894.

Increasing Pig Iron Production.

There has been a distinct increase in the production of pig iron during February, the coke furnaces, of course, contributing the greater share of the growth. Still there has been some addition to the active anthracite furnace capacity, and even the charcoal furnaces show a modest revival. Since the opening of the month additional coke furnaces have blown in, and it is well known that others will follow suit.

On March 1 the active furnace plant, grouped according to fuel used, possessed the following weekly capacity:

Fuel.		
Anthracite.....	32	16,616
Coke.....	83	89,794
Charcoal.....	18	3,754

Total March 1.....	133	110,166
Total February 1.....	125	99,042
Increase or decrease.....	+ 8	+ 10,924

The weekly product of all the furnaces on March 1 compared as follows with that of preceding periods:

	Furnaces in blast.	Capacity per week. Gross tons.
March 1, 1894.....	133	110,166
February 1.....	125	99,242
January 1.....	130	99,087
December 1, 1893.....	130	99,379
November 1.....	117	80,070
October 1.....	114	73,895
September 1.....	125	83,434
August 1.....	169	107,042
July 1.....	220	153,742
June 1.....	244	174,029
May 1.....	251	181,551
April 1.....	255	178,858
March 1.....	255	176,976
February 1.....	251	171,301
January 1.....	246	173,068
December 1, 1892.....	246	170,271
November 1.....	244	171,082

The status of the anthracite furnaces was as follows:

Anthracite Furnaces, March 1, 1894.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New York.....	18	1	713	17	6,043
New Jersey.....	11	3	1,725	8	8,150
Spiegel.....	3	1	67	2	170
Pennsylvania:					
Lehigh Valley.....	44	8	2,719	36	13,665
Spiegel.....	1	0	0	1	60
Schuylkill Valley.....	27	7	3,869	20	8,853
U. S. Susquehanna Valley.....	14	3	2,158	11	3,494
L. S. Susquehanna Valley.....	16	1	744	15	6,220
Spiegel.....	1	1	527	0	0
Lebanon Valley.....	15	7	4,091	8	2,828
Totals.....	150	32	16,619	118	44,483

For a number of months past our records of active anthracite furnaces show the following:

	Furnaces in blast.	Capacity per week.
March 1, 1894.....	32	16,618
February 1.....	27	13,627
January 1.....	29	13,081
December 1, 1893.....	32	16,188
November 1.....	34	16,166
October 1.....	34	15,338
September 1.....	43	20,758
August 1.....	51	23,572
July 1.....	62	29,268
June 1.....	70	33,916
May 1.....	67	33,168
April 1.....	72	34,641
March 1.....	74	34,773
February 1.....	74	32,871
January 1.....	70	32,772
December 1, 1892.....	69	33,602
November 1.....	69	30,869

Among the furnaces which have resumed during February are Temple in

the Schuylkill Valley, one Hokendauqua in the Lehigh Valley and one of the Pennsylvania Steel Company's furnaces. The two Lebanon furnaces are running. The Poughkeepsie Furnace stopped in February.

Coke Furnaces, March 1, 1894.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New York.....	7	3	3,749	4	2,500
Pennsylvania:					
Pittsburgh district.....	25	19	32,056	6	7,743
Spiegel.....	1	1	982	0	0
Shenango Val. Juniata and Conemaugh Valley.....	16	9	9,115	7	6,030
Spiegel.....	1	1	939	0	0
Youghiogheny Valley.....	3	1	1,169	2	1,485
Miscellaneous.....	4	0	0	4	2,500
Maryland.....	5	0	0	5	6,000
West Virginia.....	1	0	0	1	250
Wheeling District.....	8	3	3,563	5	4,480
Ohio:					
Mahoning Val. Central and Northern.....	14	4	4,806	10	7,665
Hocking Val. Hanging Rock.....	11	5	5,075	6	4,494
Indiana.....	14	1	752	13	3,041
Illinois.....	14	3	1,223	11	2,333
Minnesota.....	2	0	0	2	412
Wisconsin.....	19	0	0	19	26,875
Missouri.....	1	0	0	1	629
Colorado.....	5	1	622	4	3,388
The South:					
Virginia.....	6	0	0	6	8,572
Kentucky.....	3	0	0	3	1,800
Alabama.....	22	8	5,220	14	7,180
Tennessee.....	7	3	1,390	4	1,825
Georgia.....	38	11	10,761	27	13,940
N. Carolina.....	14	6	5,169	8	3,020
	2	1	650	1	600
	1	0	0	1	97
Totals.....	260	83	89,794	177	121,922

As compared with previous months, the active coke furnaces make the following showing:

	Furnaces in blast.	Capacity per week.
March 1, 1894.....	83	89,794
February 1.....	80	81,970
January 1.....	80	81,997
December 1, 1893.....	72	78,241
November 1.....	57	58,820
October 1.....	52	53,061
September 1.....	54	56,976
August 1.....	84	77,907
July 1.....	122	117,072
June 1.....	140	132,079
May 1.....	146	139,788
April 1.....	145	135,488
March 1.....	145	133,579
February 1.....	140	129,396
January 1.....	138	131,731
December 1, 1892.....	136	133,160
November 1.....	133	130,673
October 1.....	128	118,895

On March 1 the position of the charcoal furnaces was as follows:

Charcoal Furnaces, March 1, 1894.

Location of furnaces.	Total number of stacks.	Number in blast.	Capacity per week.	Number out of blast.	Capacity per week.
New England.....	13	1	60	12	990
New York.....	5	1	102	4	475
Pennsylvania.....	13	2	135	11	761
Maryland.....	6	0	0	6	425
Virginia.....	13	0	0	13	827
Ohio.....	9	3	305	6	308
Kentucky.....	3	0	0	3	290
Tennessee.....	8	0	0	8	991
Georgia.....	3	1	244	2	230
Alabama.....	13	3	602	10	2,390
Michigan.....	20	2	1,984	18	4,555
Missouri.....	2	0	0	2	597
Wisconsin.....	4	1	100	3	1,760
Texas.....	4	1	132	3	479
Washington.....	1	0	0	1	100
Oregon.....	1	0	0	1	200
Totals.....	118	18	3,754	100	15,869

As compared with previous months, the record of active charcoal furnaces stands as follows:

	Furnaces in blast.	Capacity per week.
March 1, 1894.....	18	3,754
February 1.....	18	3,645
January 1.....	21	4,099
December 1, 1893.....	26	4,950
November 1.....	26	5,084
October 1.....	28	5,496
September 1.....	28	5,700
August 1.....	34	5,563
July 1.....	35	7,224
June 1.....	34	8,034
May 1.....	38	8,595
April 1.....	38	8,729
March 1.....	36	8,923
February 1.....	37	8,934
January 1.....	38	8,865
December 1, 1892.....	41	9,509
November 1.....	42	9,540

Chatham in New York was to resume early in March; Bellefonte in Kentucky, Centre and Jefferson in Ohio are out; Eagle in Wisconsin, Ironaton in Alabama and Old Alcalde in Texas started in February.

In the Pittsburgh district one of the Edgar Thomson furnaces was taken off from spiegeleisen and put on Bessemer. As in a number of other cases, the additions to capacity have been made since March 1 and do not therefore swell our totals. Clinton resumed on the 5th inst., and Isabella No. 2 has also gone in. In the Juniata Valley, Kemble has gone out. Steubenville of the Riverside Iron Works started on February 10. Zanesville is out. Tropic in the Hanging Rock region has stopped, while Mary was to shut down on March 10. One of the Illinois Steel Company's furnaces was started since the beginning of the month.

In the South one of the Dayton furnaces in Tennessee started again on the 23d ult. Sewanee of the Tennessee Company is also running after a long idleness.

Stocks.

The position of stocks, sold and unsold, as reported to us March 1, was as follows, the same furnaces being represented as in former months:

Stocks:	Dec. 1.	Jan. 1.	Feb. 1.	Mar. 1.
	Tons.	Tons.	Tons.	Tons.
Anthracite pig.....	134,475	145,197	147,112	141,889
Coke pig.....	485,292	486,987	501,269	500,217
Charcoal pig.....	199,220	206,260	203,390	211,945
Totals.....	818,987	838,444	851,771	854,051

The Chamber of Commerce of Cleveland is planning a big celebration for 1896, the city's centennial year. It is proposed to make an inland marine exhibit the most important feature. Such an exhibition would include models of craft from the ancient schooner to the modern steel steamship; the various labor saving appliances for the handling of coal and ore; charts and diagrams showing the growth of commerce on the great lakes; some representation of fisheries and the life saving system and light house service; a naval parade and many other objects of the greatest interest and value.

The Austrian Government have adopted a new quick firing mitrailleuse—the "Salvator"—for use in their fortifications on the frontier. The new weapon is half the weight of the Maxim gun. Its average rate of discharge is 300 rounds per minute, with a maximum of 320. The special feature of this new gun is an oscillating pendulum regulating the speed of fire.

The new British torpedo destroyer "Hornet" on her recent speed trials exceeded 28 knots an hour, making her one of the swiftest vessels in the world.

MANUFACTURING.

Iron and Steel.

During February Edith Furnace of the Hainsworth Steel Company, in Allegheny, Pa., on a mixture of three-fourths Mesabi ore made 6455 tons of Bessemer pig iron. This is an average of over 230 tons per day, the largest output for one day being 260 tons, and for one week 1701 tons. The furnace is 16-foot bosh and 75 feet high, and is under the management of John Reis. This can be considered a good record for a furnace of this size.

The New Castle Wire Nail Company, New Castle, Pa., contemplate making some additions to their equipment, which, when completed, will increase the capacity of this concern for the manufacture of wire nails to about 3500 kegs per day.

At the present time the plant of the Aetna-Standard Iron & Steel Company, Bridgeport, Ohio, is being operated to about two-thirds capacity. This is as full work as has been done at this plant at any time since July, 1893, and is considerably beyond the average operations during that period. In regard to the statement that this concern would engage in the manufacture of tin plate, we are advised that no increase in the present plant is contemplated, but the firm have decided to change four of their sheet mills and fit them up for the manufacture of black plates for tinning. In view of the depressed condition of the iron and steel sheet industry, it has been thought advisable to divert a part of the product of this concern from old lines and enter a new field.

No. 3 furnace of the Isabella Furnace Company, at Etna, Pa., which has been idle since July 5, 1893, will resume operations during this week. This furnace has a capacity of about 200 tons per day.

It is reported that a number of Eastern capitalists are considering the advisability of erecting an extensive tube plant at New Kensington, Pa., some 20 miles from Pittsburgh, which will give employment to a large number of men. It is stated that the Burrell Improvement Company of New Kensington have offered a large bonus to secure the location of the plant at that place.

Grace Furnace of the Brier Hill Iron & Coal Company, at Youngstown, Ohio, which has been idle for some time, has again gone in blast.

A mortgage for \$52,791.12 given by the Coleman, Shields Company of Niles, Ohio, to banking houses in Youngstown, Warren and other nearby towns has been recorded. The mortgage is upon the rolling mill and other property of the Coleman, Shields Company, at Niles, and is to secure notes held by the grantees. The plant of this concern has been idle since last summer.

The puddling department of the plant of the Pittsburgh Forge & Iron Company, Allegheny, Pa., is in operation to nearly full capacity, the regular rate of \$4 per ton for boiling prevailing.

At the plant of the Otis Steel Company, Limited, Cleveland, Ohio, 25 men in the Bessemer department have been notified that hereafter 12 tons an hour will be required instead of 10. The wages of the men were reduced 20 per cent. some months ago, and they are now getting from 12 to 15 cents per hour. The management states that the low prices ruling for steel have made a reduction of tonnage expense absolutely necessary.

The Schiffer Bridge Company of Pittsburgh have secured the contract for the erection of a building for the Whitaker Iron Works, at Wheeling, W. Va., destroyed by fire some months ago. The new buildings will be entirely of iron and are to be completed in about 90 days. The same firm have also received a contract for the erection of a steel roof to cover the machine shop of the Brooks Locomotive Works, Dunkirk, N. Y.

A serious explosion occurred last week at Furnace C of the Edgar Thomson Steel Works, Bessemer, Pa. A number of men were seriously injured and considerable repair work will have to be done on the furnace before it will be in condition to resume blast.

The stockholders of the Springfield Iron Company held their annual meeting, at Springfield, Ill., on the 27th ult., and elected the following directors: Charles Ridgely, William Ridgely, William Barret Ridgely, Edward Ridgely, George N. Black, John C. Lamb and John W. Bunn.

All are re-elected, except Mr. Lamb, who succeeds Lewis H. Miner.

Some excellent records for production have recently been made at the Bessemer steel plant of the Shenango Valley Steel Company, New Castle, Pa. In one day recently there was turned out on two turns 714 tons of billets, which is the largest record for production in any one day in the history of the concern.

Central Furnace of the Cleveland Rolling Mill Company, Cleveland, Ohio, which has been idle for some months, will resume operations in the near future, the employees having agreed to accept a reduction in wages.

The bondholders of the Crane Iron Company held another meeting at Philadelphia for the purpose of effecting a plan of reorganization. It was decided to appoint a committee to secure the requisite number of bondholders to agree to a foreclosure under which the plant will be bought in by the company. The committee is composed of Gordon Monges, W. Spilling, Robert F. Kennedy, J. A. Harris, Jr., and Robert E. Hastings.

The York Rolling Mill, at York, Pa., which resumed operations early in January, has again shut down indefinitely on account of a lack of orders.

On March 1 fires were drawn in the Bessemer department of the Otis Steel Works, Cleveland, Ohio, and 125 men went on strike. The cause of the difficulty was a notice posted a few days before that, taking effect March 1, workmen would be required to work 120 tons of metal for a day's work instead of 100 tons. The men say this is a practical reduction in wages, and is the fourth cut within a year.

The Shickshinny Tube Company, capital \$40,000, have been chartered in Pennsylvania. The directors are: R. M. Tubbs, N. B. Crary, E. W. Garrison, M. H. Arnold, A. W. Stackhouse, C. W. Buckley, G. M. Beadle, E. S. Stackhouse and J. J. Richards of Bloomsburg.

The plant of the Tyrone Iron Company, at Tyrone, Pa., has resumed operations in full in every department, after a long term of idleness. The outlook for at least some months of work is stated to be very good.

Canadian newspapers announce that a syndicate of American capitalists is asking the towns of Port Arthur and Fort William for a bonus to build a smelting plant and rolling mill, capable of turning out 40,000 tons of pig iron and 30,000 tons of steel rails per annum. At a joint meeting of the councils of the two towns it was the opinion that they would be warranted in giving \$100,000 each and a free site jointly. The names of the promoters of the enterprise are not given.

During the week ending February 24 the Rosena Furnace, at New Castle, Pa., made 1723 tons of pig iron, while on the 28th ult., 294 gross tons were turned out. The furnace, which is 18 x 75 feet, is now using one-third ore mixture south side ore from the Oliver Mining Company's Missabe Mine, and is turning out 260 tons per day. E. D. Reis is manager of the furnace.

One of the furnaces of the Dayton Coal & Iron Company of Cincinnati, Ohio, blew in February 23. The furnaces are located at Dayton, Tenn.

Mary Furnace of the Ohio Iron & Steel Company, at Lowellville, Ohio, will probably close down about March 10.

A. W. Brown, who recently purchased at assignee's sale the plant of the Ellwood Steel Company, at Ellwood, Pa., has contracted with the Leeburg Foundry & Machine Company of Pittsburgh for the necessary machinery to equip this plant for the manufacture of black sheets for tinning purposes. It is the intention to change the four sheet mills to four tin plate mills. There is also to be added an additional cold rolling mill, four doubling shears, two Mesta patent vertical squaring shears and one Mesta patent pickling machine. The plant, when completed, will be a modern four-mill tin plate plant and is expected to be ready for operations about April 1, with a capacity for producing about 25 tons of black sheets on three turns. The name of the concern will be changed in the near future to the Ellwood Tin Plate Company. It is probable that when the plant is in successful operation on the manufacture of black sheets for tinning purposes the necessary machinery will be added and tin andterne plates made.

J. W. Dougherty, superintendent of the blast furnace department of the Pennsylv-

vania Steel Company, at Steelton, Pa., sends us a summary of the operations of the furnaces of that company during the month of February: No. 3 furnace resumed again on the 6th ult. after being banked for 36 days. It is now making special basic open hearth iron. No. 1 furnace turned out 2108 tons of spiegel, running 16 per cent. manganese, or an average of over 75½ tons per day for the month. This is a large daily product compared with what the furnace had done before when running on spiegel, and considering the fact that the ore used was of a low percentage in manganese. It is a 60-foot stack, with a 15 foot bosh, and has been two and one-half years in blast, 11 months of which has been on spiegel.

The Thomas Iron Company's Lucy Furnace, which is situated near Glendon, Pa., will, it is stated, resume blast in a short time.

No. 1 Sheridan Furnace, at Lebanon, Pa., which recently blew in, is doing good work. The work of cleaning out No. 2 stack, with a view to remodeling it so as to use exclusively Cornwall ore, is nearly completed.

Passaic blast furnace, at Passaic, N. J., is being rebuilt.

Furnace No. 2 of the Clifton Iron Works, at Ironaton, Ala., has blown in.

Both of the Kemble furnaces, at Riddlesburg, Pa., are now idle, one having blown out only recently.

The furnace of the Valentine Iron Company, at Bellefonte, Pa., will resume at an early date. It has been idle since last July.

The rejuvenated Bear Spring Furnace, in Stewart County, Tenn., is said to be working satisfactorily, turning out about 20 tons a day of cold blast iron.

It is now almost a settled fact that the rolling mill of the Johnson Company will be removed from Johnstown, Pa. The company's switch works will, however, remain in Johnstown, and, moreover, their capacity will be largely increased.

It is stated that the Cleveland Rolling Mill Company, Cleveland, Ohio, are preparing to resume operations at their blast furnaces Nos. 5 and 6, which have been idle since August last. A notice of a cut in the wages of the blast furnace employees is regarded as a forerunner to the resumption of operations.

The salamander of No. 2 furnace of the Pennsylvania Steel Company, Steelton, Pa., has been removed, and as soon as repairs are completed on No. 4 work will be commenced on that furnace.

Jefferson Furnace, situated at Oak Hill, Jackson County, Ohio, has gone out of blast, and it is stated that in all probability it will never run again. It is a cold blast furnace, using charcoal, and has been in operation since 1851. The company were organized in January, 1851, with 24 members, all Welshmen, and all members of the Calvinistic Methodist Church. One of the rules of the company was that the furnace should never be run on Sunday, and the rule was observed for 40 years. The furnace was always stopped on Thanksgiving Day also. It was a profitable concern from the beginning, and has made all its owners wealthy. It has paid as high as \$1200 dividend in one year on a share of \$500, and it has paid altogether over \$500,000 in dividends.

The McCullough Iron Company's plant at Northeast, Cecil County, Md., has shut down again, after a short run of one week.

In the courts at Pittsburgh on Saturday, March 3, the discharge of Receiver John Eaton of the Oil Well Supply Company of that city was ordered. The concern have secured an extension from their creditors, and are now in a position to manage their own affairs. John Eaton, president of the Oil Well Supply Company, was appointed receiver on June 19 of last year. The concern have arranged to pay their creditors 6 per cent. of the amount of their claim at once, and 2 per cent. monthly for 20 months, and after that period 2½ per cent. monthly. The discharging of the receiver of the Oil Well Supply Company will not result in the starting up of the plants of the Elba Iron Works and the Continental Tube Works, both at Pittsburgh and owned by this concern, and which have been idle for about a year. Owing to low prices ruling the products of these plants can be purchased in the open market to better advantage than they can be manufactured. At the time of the discharge of the receiver of the Oil Well Supply Company, the receiver for the Eaton, Burnham & Cole Company, with main offices in Pittsburgh and works in

Bridgeport, Conn., was also discharged. This concern have also secured an extension from their creditors.

The cut nail factory of the Laughlin Nail Company, at Martin's Ferry, Ohio, with offices in Wheeling, W. Va., resumed operations on Monday, the 5th inst., after an idleness of several weeks. As already known, the nail factory of this concern is the largest in the world, containing 225 nail machines, with an annual capacity for producing 600,000 kegs of cut nails.

The steel plant of the Laughlin & Junction Steel Company, at Mingo Junction, Ohio, which has been idle for several weeks, resumed operations on Monday, the 5th inst.

Tropic Furnace of the Tropic Iron Company, at Jackson, Ohio, went out of blast last week.

The Garland Chain Company, recently organized at Pittsburgh, have purchased a site containing 2 acres of land at Rankin on the line of the B. & O. R. R., a few miles from that city, and will at once commence the erection of the necessary buildings for the manufacture of their patent weldless chain machinery, which is now being manufactured at Bridgeport, Conn.

A number of men employed in the armor plate shops of the Homestead Steel Works, Homestead, Pa., have recently been suspended on account of lack of orders.

The blast furnace of the Lehigh Steel & Iron Company, at Aineyville, Pa., has resumed operations after an idleness of two months.

Four of the iron firms of Lebanon, Pa., have announced a reduction in the wages of their puddlers from \$3 to \$2.50 per ton, in order to compete with firms at Reading, Pottstown and other places, who have reduced to the same figure. It is rumored that the men, reinforced by the helpers, have decided not to accept the reduction and will ask for a conference with the firms. The firms which posted notices of a reduction are the Pennsylvania Bolt & Nut Works, Lebanon Rolling Mills, West Lebanon Rolling Mills and East Lebanon Iron Company. The employees of these firms did not resume work in the departments affected. They denied, however, that they were on strike. An effort is being made to effect a compromise and it is not believed that the plants will be idle long.

At Wyandotte, Mich., the plate mill of the Eureka Iron & Steel Works has been burned. Loss, \$65,000.

On March 5 the wages of the puddlers in the Central Iron Works and Chesapeake Nail Works, Harrisburg, Pa., were reduced from the \$3 basis to \$2.50, the wages paid by other manufacturers in that district. Both establishments were idle last week, owing to lack of orders.

On March 3 notice was posted at the Phoenixville Iron Works, Westchester, Pa., to the effect that there will be no more work at that plant until further orders. About 800 hands are thus thrown out of employment. Lack of orders is the cause.

Machinery.

John W. Taylor of Menominee, Wis., is arranging to start a machine shop in the building recently used by the Provost Mfg. Company. He will manufacture a machine for boring holes in hardwood flooring, by which the holes are bored at the same time that the flooring passes through the planing machine. Mr. Taylor was until recently superintendent of the Menominee Iron Works.

A new foundry is to be started in San Antonio, Texas.

Negotiations are in progress for the removal to Minneapolis of a foundry now manufacturing cast iron soil pipe in Chicago. It is proposed to manufacture, also, pipe fittings, iron sinks, bathtubs, &c. At present there is no such establishment west of Chicago and Milwaukee to the Pacific Coast.

A report citing that the Michigan Forge & Iron Company have paid off their known indebtedness, divided the residue of assets among stockholders and retired from business, was recently filed with the county clerk at Detroit, Mich., signed by Hugh McMillan, William K. Anderson and James McMillan as a majority of the last Board of Directors.

Miner & Peck Mfg. Company of New Haven, Conn., in addition to their regular line of the Peck drop press, are about to place on the market a line of friction drop

hammers. These hammers possess new features, the result of long experience and study of the subject.

The Gates Iron Works have purchased the plant of the Chicago Iron Works, at the southeast corner of Willow street and Hawthorne avenue, Chicago, from Rockwell King, receiver, for \$25,000. The ground fronts about 300 feet on Willow street and 250 on Hawthorne avenue. The plant comprises a large brick factory, 150 x 200 feet, with pattern lofts, traveling cranes, &c. There are large blacksmith and wood working shops, and also a large number of patterns of the most modern mining machinery. The plant is equipped with about \$60,000 worth of machinery. In addition to this there is a valuable lease on the ground, running for 25 years, at a low rate. The Gates Iron Works have been located at 50 South Clinton street, Chicago, for 53 years. They will operate both plants, and next spring will build large shops and a foundry on the grounds just purchased and move the Clinton street establishment to the one just acquired.

The Penberthy Injector Company of Detroit, Mich., doubled the size of their plant during the past year in rebuilding it after the fire. The increased facilities at that time appeared to be imperatively required by the growth in their business. The widespread depression in trade interfered with their expectations to some extent, but the company are in good shape for a business revival and can handle a much larger volume of business easily when it comes. Their export business is of fair proportions and steadily growing. They have in preparation some new goods for steam users.

The Rand Drill Company's Chicago branch, in the Monadnock Block, has recently booked some fair contracts for mining machinery. Manager James F. Lewis reports prospects for business somewhat brighter from gold mining companies, but the silver and iron ore mining companies are taking very little machinery.

The M. C. Bullock Mfg. Company of Chicago, builders of mining machinery, have started their works after an idleness of nearly four months. The orders in hand, however, are only sufficient to give employment to part of their regular force. Sales were made from stock on hand during the shut down.

William Stormont has definitely decided to rebuild the foundry at Ottawa, Ill., recently destroyed by fire. A new location has been selected where more room and better facilities are available.

The machine shop of J. L. Brown, at Reed City, Mich., was burned on the night of February 21, involving a loss of \$3000.

The Mann Vise & Clamp Company of Cleveland, Ohio, will commence the erection of a new foundry. The capital stock of the concern is given as \$40,000, and the incorporators are F. D. Everett, K. M. Brune and F. E. Dellenbaugh.

The Morgan Pump & Conveyor Company of Kansas City, Kan., have been organized to manufacture pumps and other appliances under letters patent granted to Waitman M. Morgan. The capital stock of the company is \$100,000. The following are the directors elected for the first year: W. M. Morgan, John N. Trout, George McCutcheon of Kansas City, Mo.; M. H. McHale, L. W. Gilpin and William H. McHale of Kansas City, Kan.

Duthe & Daggett of Indianapolis, manufacturers of fine tools, are not only working their usual force, but on three days of the week run the establishment until 9 p.m.

Articles of association have been filed by the Luckwood Machine Company of Janesville, Wis., to manufacture wind engines, feed grinders, &c. The capital is \$30,000; incorporators, William and Charles H. Luckwood and F. B. Burton.

The Goubert Mfg. Company of New York City have opened a branch office in room 403 Lewis Block, Pittsburgh, which will be in charge of J. H. Harrison. A full line of Goubert feed water heaters and Stratton steam separators, of which this concern are the sole manufacturers, will be carried.

The plant of the Racine Iron Company, at Racine Junction, Wis., was burned on the 25th ult. The loss on the machinery and stock, mainly covered by insurance, is estimated at \$10,000. The building was owned by other parties. The Racine Iron Company manufactured general castings and had many patterns on hand which were burned or ruined by water. New quarters will be secured as speedily as possible and operations resumed.

The works of L. Spence & Son, Martin's Ferry, Ohio, manufacturers of threshing machines and steam engines, are in full operation, with sufficient work on hand to keep the concern busy for some months. The output at the present time consists principally of portable and stationary engines. This concern have just added about \$10,000 worth of new and improved machinery to their plant. We are advised that their works have run on an average of 11 months each year since 1859.

The Canton Rolling Mill Company, Canton, Ohio, have just placed an order with the Lloyd Booth Company, Youngstown, Ohio, for a sheet mill and roll lathe. The latter concern have quite a number of orders on hand and the outlook for the future is considerably improved. The Canton Rolling Mill Company have also given an order to Wm. Tod & Co., Youngstown, Ohio, for a 36 x 40 Porter-Hamilton engine.

T. T. Burchfield of North Seventh street, Philadelphia, is supplying to the Ringing Rocks Electric Railway Company, Pottstown, Pa., a 260 horse-power M. A. Green engine, and two 150 horse-power boilers. He will also supply the pumps, heaters, injectors, and fittings necessary for the installation of the plant.

Daniel Kelly, lately in the machinery business on North Seventh street, Philadelphia, is now to be found in the Betz Building in that city, where, besides pushing sales of new and second hand machinery, he is looking after the interests of Elias Brewer & Co. of Boston, manufacturers of hydraulic, electric, steam passenger and freight elevators, his district comprising the States of Pennsylvania, New Jersey, Delaware, Maryland, and the South.

Jenkins & Lingle of Bellefonte, Pa., engineers and machinists, report a decided improvement in volume of business in their line, and that they are very busy on some large orders. They have just shipped a large steam hammer to Buffalo, N. Y., and another to Home, Kan., and they are at work on others for Atlantic City, N. J., and Pittsburgh, Pa.

The American Machine Company have decided to build their plant at Pawtucket, R. I., where a tract containing 30 acres has been acquired.

The name of the Potter & Atherton Machine Company, Providence, R. I., has been changed by act of Legislature to that of the A. T. Atherton Machine Company.

At the annual meeting of the directors of the Berry & Orton Company, manufacturers of machinery for wood working, Philadelphia, the following officers were elected: President, L. H. Berry; vice-president, B. B. Wolff; secretary and treasurer, H. W. Thorn, and general manager, H. C. Baker.

The Backus Water Motor Company of Newark, N. J., have recently built and moved into a new factory at 174-182 Penn avenue. The company manufacture gas engines, electric ceiling fans and water motors.

The Wright Machine Company, at Worcester, Mass., have resumed operations after several weeks of idleness.

A charter has been granted to the Petersburg, Va., Iron Works. The object of the company is the building of dredges, scows, tugboats and other such craft, and the manufacture of iron products, such as engines, boilers, machinery, castings, &c. The principal office is to be in Petersburg. The capital stock is not to be less than \$10,000 nor more than \$100,000, divided into shares of \$100 each. The officers are: C. P. E. Burgwyn of Richmond, president; R. B. Davis of Petersburg, vice-president; I. M. Huston of Petersburg, secretary and treasurer. The above named officers, with George A. Endley of Chase City and Chas. E. Hunter of Fredericksburg, are to constitute the Board of Directors.

The plant of the Racine Iron Company, near Racine Junction, Wis., has been burned. The company's loss is \$15,000 on machinery and stock.

A commission has been granted to the Tugaloo Iron Works of Abbeville, S. C. The company intend to operate an iron foundry and machine shop on a capital of \$12,000, which may be increased to \$50,000.

The machine works at Buena Vista, Va., one of the largest of their kind in the South, have been sold at public auction to the A. K. Rarig Company of Columbus, Ohio, their projectors, for \$20,000. The plant will be put in operation as soon as possible. The price paid is said to be about one-tenth of the value of the plant.

The machine shop of Baldwin, Tuthill & Bolton, at Grand Rapids, Mich., which suffered from fire a few weeks ago, is now running full force and full time again. The repairs of the shop will be completed in about three weeks.

The Falcon Iron & Nail Company, Niles, Ohio, have placed an order with the Adams Boiler Company, Cleveland, Ohio, for a 500 horse-power boiler, and the work of placing it in position will be commenced at once.

Hardware.

We have already referred to the fact that Schaw, Ingram, Batcher & Co., Hardware merchants of Sacramento, Cal., recently erected a building, 42 x 100 feet, for the manufacture of sheet iron and steel pipe for mining, water works, power and irrigating purposes. They have since completed the erection of another building, 34 x 70 feet, which will be used as a dipping house.

At the annual meeting of the Corbin Cabinet Lock Company, New Britain, Conn., held recently, the old Board of Directors was re-elected. The officers for the ensuing year are P. Corbin, president and treasurer, and George W. Corbin, secretary.

It is reported that the Racine Hardware Mfg. Company's plant, Racine, Wis., has resumed operations, with a working force of 350 men.

Steps are being taken for the removal of the plant of the Holt Mfg. Company from Hartford, Conn., to Manchester. The company intend to increase their capital stock and enlarge their manufacturing facilities.

The Champion Roaster Company, Butte, Mont., have been recently organized. The incorporators are Lee Mantle, David A. Wesley and Frank S. Smith. The company will manufacture the bake oven invented by Mr. Wesley.

The St. Louis Wringer Company, St. Louis, Mo., have been incorporated, with a capital stock of \$4000. The incorporators are J. W. Tremoyne, R. C. Westfall and L. M. Eidman.

Colby Wringer Company, Montpelier, Vt., advise us that notwithstanding the discouraging condition of general business during the past few months their factory has not shut down and they have not been obliged to discharge any of their men. They report a very encouraging increase in the demand for their wringers, which has been quite noticeable since the opening of the new year.

The Port Townsend Steel Wire & Nail Company's mills, at Tacoma, Wash., are reported to be working at a lively rate to fill orders. The mill turned out its first nails in April, 1893. The capacity of the mill is 400 kegs per day of ten hours. The company manufacture their own kegs on the ground. The plant comprises, in addition, one of the largest iron and brass foundries in the State; also a machine shop especially fitted up for steamboat and mill work. The nail machines in use, 35 in number, are the invention of George Alexander, the superintendent. The machines turn out nails from 3-16 inch to 13 inches in length.

League Cycle Company, Hartford, Conn., advise us that orders for their chainless wheel have been so numerous that on Monday, 26 ult., they commenced running their factory with two sets of employees, day and night, working 22 hours out of the 24. They had for three weeks previously been running 14 hours a day. At a meeting of the directors of the company, held on the 28th ult., Manager A. H. Parker was elected vice-president and manager.

The American Crayon Company, Waltham, Mass., and Sandusky, Ohio, who make a large line of crayons, have rebuilt their Sandusky box shop, which was destroyed by fire in December, and resumed operations there March 1. The new factory has a capacity of 10,000 boxes a day.

The plant of the Western File Company, Limited, at Beaver Falls, Pa., was sold at sheriff's sale on Saturday, the 3d inst., the purchasers being the Harmony Society, which owns stock in the concern to the amount of \$40,000, and also holds judgments against it aggregating \$225,000. It is not the intention of the Harmony Society to operate the plant, but it will be sold as soon as possible to the best advantage. The plant is valued at \$450,000, and has been idle for several years, but it is said that it has been kept in such perfect repair that operations can be resumed on 24 hours' notice.

The Iron and Metal Trades.

Very few additional details have come to light concerning the Ore purchases alluded to last week. Possibly the most interesting statement connected with the matter is that the Minnesota Mesaba, notably the Canton, a physically unfavorable Ore, has sold at \$2.80, delivered, Cleveland. It may seem doubtful whether the Rockefeller interest in the Mesaba range will meet such prices. Buyers, however, have been encouraged in the belief, through the recent sales, that they are sure of very cheap Ore this season.

Our monthly statistics of Pig Iron, published elsewhere, show that February recorded an increase of close to 11,000 tons in the weekly capacity, and it is well known that west of the Alleghanies and north of the Ohio further additions to the number of active plants have been made since March 1, and that more are coming.

So far as is known no contracts have yet been made for non-Bessemer Lake Ores, so that the capacity of the furnaces in the Central West making Foundry and Forge grades to pound the markets of the country cannot yet be gauged. It is, sure however, that considerable displacement will take place.

There are indications that so far as the Chicago market in Structural Iron is concerned the great local mills propose to become the controlling factor. Since that market has been one of the chief outlets for great Pittsburgh concerns there is some chance for a very sharp struggle. The fact that Beams have been offered at 1.25¢, Chicago, indicates that Pittsburgh means to hold its own. In Central Ohio Cleveland has made low figures on its share of an order for about 1000 tons of Structural Shapes.

In the East, Pittsburgh continues the leader in the downward movement. Plates have been sold at Philadelphia at 1.15¢, delivered, equal to 1.02½¢, Pittsburgh. This is the record breaker, although the price has been approached by others.

The Providence order for about 5000 tons of Elevated and Bridge work, on which only Eastern concerns bid, has been taken at least in part by the receiver of a large mill in Central Pennsylvania. The full details are not yet at hand.

With Steel Billets back to \$15.25, Pittsburgh, and at correspondingly low prices in the East, and with Finished Iron and Steel at the lowest prices, the near future does not look rosy. Some encouraging talk is indulged in, but no facts are brought forth to convince those who would be only too glad to accept brighter views.

Philadelphia.

Office of The Iron Age, 220 South Fourth St., PHILADELPHIA, Pa., March 6, 1894.

The situation in Iron and Steel shows no improvement, although, contradictory as it may seem, there is a very much better feeling. It is difficult to explain why this should be so, but that the improved feeling exists is beyond question. Usually this is the preliminary to a better business, but whatever confidence the trade feel they do not feel enough to make them buy anything they can do without. Prices are at the very lowest for everything except Billets, and Billets for the time being are a dead letter. Holders can ask whatever figures they please, buyers simply say they are not in the market, and unless strong inducements are offered that seems to close the matter. Lower prices than ever have been made on Plates and Shapes, and possibly on other specialties, but it brings no more business, so that it is difficult to see how the mills can be improving their position. The better weather and the improved feeling in financial circles are in some measure reflected in the Iron market, and the trade are looking for a larger business, pretty much as they look for warmer weather, as something that must come in due season.

Pig Iron.—Sales have been on about the usual scale, no larger, no smaller, but fairly in line with the offerings. The feeling is not strong by any means, and with prices ruling as they now are at the lowest ever recorded, consumers seem satisfied to cover their requirements by purchases of small lots, rather than by contracting for three or six months in advance. This is in part due to the possibility of unfavorable action in regard to the tariff, but however much such action might be deplored, everything has been fully discounted, and at current prices there is no possibility of foreign material competing with the domestic article. Of course, it would have a tendency to keep things down, and would retard the improvement which is legitimately due, but it could hardly lead to lower prices. Nevertheless, consumers are determined to be on the safe side, and to that must be attributed their policy of extreme conservatism. At the same time it is obvious that consumption is not increasing to any very great extent, otherwise there would be more scarcity of Iron as well as firmer prices. About 100,000 tons per week seems to have been the limit of consumption during the past four or five months, and as there has been a corresponding output, prices have shown very little change, although of late, under reports of cheaper Ores, there is less firmness than there was some time ago. Sales are chiefly in small lots, and for Philadelphia delivery at prices within the limits named below, viz.:

No. 1 Foundry	\$13.00 @	\$13.50
No. 2 Foundry	12.25 @	12.75
Standard Gray Forge	11.00 @	11.25
Ordinary Gray Forge	10.75 @	11.00

Steel Billets.—The market is very unsettled and not very active, although some business has been done and some is still under negotiation. Sellers claim they have nothing under \$17.75 @ \$18, delivered, but large buyers are not in the market at over \$17.25 @ \$17.50, although those figures are in a measure contingent on freight rates. The railroads claim \$2.30 as the schedule, but some parties have had a \$2 rate, and it will be hard to find any one willing to pay more, unless they are satisfied that the rate is uniform. Meanwhile, as al-

ready shown, the ideas of buyers and sellers are somewhat apart, \$17.25 @ \$17.50 being buyers' ideas of value and \$17.75 @ \$18 the asking rates.

Finished Material.—Prices are working toward a lower level, the past week's sales having been at the lowest yet recorded—viz., 1.15¢, delivered, for Plates, and that or very close to it for Shapes. These, of course, were large lots, and are from 15¢ to 30¢ per 100 lb less than is ordinarily realized for the general run of small orders. Business is not as plentiful as it was three or four weeks ago, and although the prospect is for a heavier consumption in various lines there is nothing to encourage the hope of better prices. Manufacturers seem to recognize this feature, and are adjusting themselves accordingly. Inquiries this week are for a moderate tonnage, and include about 1500 tons of Plates and 1000 tons of Shapes for Providence, besides a very fair amount from smaller consumers, who appear to be better employed than many of the large concerns. Quotations are subject to liberal concessions, but on small lots the following fairly represent the market:

Grooved Skelp, delivered.....	1.25¢	@	1.30¢
Best Refined Bars.....	1.30¢	@	1.40¢
At interior points.....	1.15¢	@	1.20¢
Tank Steel.....	1.30¢	@	1.40¢
Heavy Plates.....	1.35¢	@	1.45¢
Shell.....	1.50¢	@	1.60¢
Flange.....	1.70¢	@	1.90¢
Angles.....	1.40¢	@	1.50¢
Beams and Channels.....	1.50¢	@	1.60¢

Old Material.—Market very dull, but as a rule there is no change in prices, although holders feel that good stock ought to command more money than buyers are now willing to pay. Sales at about the following quotations (delivered):

Heavy Melting Steel.....	\$10.00	@	\$11.00
Light Melting Steel.....	8.00	@	9.00
No. 1 Wrought Scrap.....	10.00	@	11.00
Machinery Cast.....	9.50	@	10.00
Wrought Turnings.....	8.50	@	9.00
Cast Borings.....	6.00	@	6.50
Old Iron Rails.....	12.50	@	13.00

Chicago.

(By Telegraph.)

Office of *The Iron Age*, 59 Dearborn street, Chicago, March 7, 1894.

Prices at length seem to be very close to bottom on most classes of Iron and Steel. This opinion is based on the fact that there is no longer a wide range between the quotations of manufacturers who are seeking new business. They are really remarkably close together. Some manufacturers are inclined to think that this is a dangerous time to sell their product too far ahead with prices so close to actual cost. Reductions in labor and reductions in raw materials have all been discounted, and whatever change may now take place is likely to be in the line of dearer rather than cheaper cost.

Pig Iron.—The week was a quiet one in all classes of Pig Iron, with very few sales reported of over 100 tons. Inquiries for local Coke Iron are of a character indicating considerably better business in the near future. Quotations are given as follows, for cash:

Lake Superior Charcoal.....	\$15.00	@	\$15.25
Local Coke Foundry, No. 1.....	12.00	@	12.50
Local Coke Foundry, No. 2.....	11.50	@	12.00
Local Coke Foundry, No. 3.....	11.00	@	11.50
Local Scotch.....	13.00	@	13.50
Ohio Strong Softeners No. 1.....	13.50	@	14.50
Southern Silvery, No. 1.....	12.00	@	12.50
Southern Silvery, No. 2.....	11.00	@	11.75
Southern Coke, No. 2.....	11.25	@	11.50
Southern Coke, No. 3.....	10.75	@	11.00
Southern, No. 1, Soft.....	11.25	@	11.50
Southern, No. 2, Soft.....	10.75	@	11.00

Tennessee Charcoal, No. 1.....	15.50	@	16.00
Tennessee Charcoal, No. 2.....	15.00	@	15.25
Southern Gray Forge.....	10.25	@	10.50
Alabama Car Wheel.....	18.50	@	18.65
Jackson County Silvery.....	15.00	@	16.00
Other Ohio Silvery.....	13.00	@	13.50
Coke Bessemer.....	12.00	@	12.50

Bars.—The inquiry for Bar Iron has been light for some days and sales were small. Large buyers report that they find manufacturers now inclined to firmness in price. It is somewhat encouraging to find that bottom appears to have been reached. Quotations on mill shipments run on ordinary specifications from 1.15¢ to 1.25¢, Chicago. Soft Steel Bars have receded a little, and quotations on strictly Billet stock range from 1.20¢ to 1.30¢, Chicago, on mill shipments. A large consumer endeavored last week to make a season contract at present prices, but found manufacturers unwilling to sell for longer delivery than July 1 and placed some business with this restriction. Jobbers report an irregular demand for small lots from stock and continue to quote at 1.35¢ @ 1.40¢ for Bar Iron, and 1.35¢ @ 1.50¢ for Soft Steel Bars.

Structural Material.—Dealers have experienced quite a good trade in small lots from yard. Building is opening up to some extent and small quantities of material are usually wanted almost immediately on application. This helps the dealers who carry stock. The local Bridge builders are being crowded by competition from Eastern works. Small contracts only have recently been in the market, but even on these the Eastern concerns have made very low figures to capture the trade. Quotations at present are as follows for Chicago delivery: Beams and Channels, 1.40¢ @ 1.45¢; Tees, 1.65¢ @ 1.70¢; Angles, 1.35¢ @ 1.45¢; Universal Plates, 1.40¢ @ 1.50¢. Small lots from stock are sold at an advance of 10¢ @ 15¢ per 100 above these prices.

Plates.—Actual business has been small since last report, but more work continues to come in sight and the prospects are flattering for a considerable increase in trade in this branch. Mill shipments, Chicago delivery, are quoted as follows: Tank Steel, 1.35¢ @ 1.45¢; Flange Steel, 1.80¢ @ 1.90¢; Fire Box, 2¢ @ 5¢. Store prices are as follows: Iron or Steel Sheets, Nos. 10 to 14, 2¢ @ 2.10¢; Tank Steel, 1.80¢ @ 2¢; Flange Steel, 2.15¢ @ 2.35¢; Boiler Tubes, 70 and 10 % off.

Sheets.—The very low prices recently quoted on Light Sheets appear to be largely due to efforts of manufacturers to sell their Iron Sheets, which are in considerably less demand than Steel Sheets. Offers of this class of material have recently been made at ridiculously low rates. Quotations on mill shipments of No. 27 Soft Steel Sheets are 2.45¢ @ 2.55¢, Chicago. Galvanized Sheets are moving very slowly and some manufacturers are giving extra inducements to secure orders. They are also soliciting business among the small trade, whose patronage is usually given to jobbers exclusively. Quotations on mill shipments of Juniata are generally 75 and 10 and 5 % off, but a few mills are making somewhat better terms. Quotations on Sheet Copper are unchanged at 30 % @ 35 % off for Light Sheets and up to 40 % off for Heavy Sheets, according to quantity.

Merchant Steel.—No special change has occurred in material coming under this head. Mill shipments, Chicago delivery, are quoted as follows: Smooth Finished Machinery, Tire and Open Hearth Spring Steel, 1.85¢ @ 1.95¢; Ordinary

Bessemer Machinery, 1.55¢ @ 1.60¢; Bessemer Tire, 1.40¢; Ordinary Tool Steel, 6¢ @ 7¢; Specials, 12¢ and upward.

Billets and Rods.—The manufacturers of Steel Billets and Wire Rods report the mills still full of work, while on the other hand consumers seem to be well supplied and inquiries are light. Nominal quotations are still \$18 @ \$18.50 for Billets and \$25 for Rods.

Rails and Track Supplies.—The Rail situation is in all respects the same as previously reported. Leading railroads continue to hold back their orders. Prices on standard Rails are unchanged at \$25 @ \$27, according to quantity. Splice Bars are unchanged at 1.40¢; Track Bolts with Hexagon Nuts, 2.40¢ @ 2.45¢; Spikes, 1.75¢ @ 1.80¢.

Scrap.—Business in Old Material is spasmodic. Here and there a dealer reports some business, but generally trade has been extremely dull. Some large transactions have taken place in old World's Fair material, which has been sold for re-use. Quotations in a regular way per net ton are as follows: No. 1 Forge, \$8.50 @ \$9.50; No. 1 Mill, \$6.50 @ \$7; Pipes and Flues, \$6; Heavy Cast, \$7.50 @ \$8; Stove Plate, \$5.50 @ \$6; Fish Plates, \$10; Cast Borings, \$3.50; Wrought Turnings, \$5; Heavy Mixed Steel, sales at \$6.50, gross ton; Light Mixed Steel, nominally \$5, with no demand.

Old Rails and Car Wheels.—Some transactions have taken place in Old Rails, but at localities outside this territory, so that quotations here have not been affected by such business. Nominal quotations are reported by dealers at \$11 @ \$11.50. Old Steel Rails, long lengths, are still quoted at \$9.50 @ \$10, but short pieces have been sold at \$7.25. Old Car Wheels are nominally quoted at \$10 @ \$10.50.

Metals.—Lake Copper in carload lots continues to sell at 10½¢. Casting Copper is unchanged at 9.50¢. Spelter is quoted at 3.75¢, the firmness of the market being ascribed to the strict control which has now been gained by the producers. Pig Lead is somewhat firmer under favorable reports from Washington, and 3 15¢ is asked, with 3.10¢ bid.

Pittsburgh.

(By Mail.)

Office of *The Iron Age*, Hamilton Building, Pittsburgh, March 6, 1894.

The first week in March has brought no material change in the Iron and Steel trades. Transactions continue to be confined to lots for close delivery, tending to show that buyers have not that confidence in the market which the low prices ruling on all products would warrant. In Pig Iron, trading is light and prices are weak. Steel is in light demand, with a majority of the mills fairly well supplied with business. Structural Material is improving in demand, but prices are lower than ever. Plates are also gaining in tornage, but not in prices. Wire Rods, Wire and Wire Nails are the bright spots on the horizon, the mills having all they can do for the next month or so. Coke is improving in demand, but prices are no better, short time contracts for Furnace Coke having recently been made on the basis of 90¢ per ton at oven. The Armor Plate difficulty between the Carnegie interests and the Government, made

public during the last week, has caused no end of discussion in the trade here. It is conceded that the true inwardness of the trouble has not been made public. An official statement from the firm is expected within a few days as a result of cable communication with Mr. Carnegie, who is in Egypt. The conspiracy story involving four former employees, who are said to have divided \$35,000 between them as a reward for information furnished the Government, is not credited and is regarded as impossible and absurd.

Pig Iron.—The market does not show any gains in volume of business, while prices continue weak and are a shade lower. It is evident that buyers have figured out a lower cost of production since the transactions in Ore took place, and are content to put off purchases until the last moment in the belief that by waiting they will be able to do better. On the other hand, Pig Iron makers claim that taking Ore, Coke, Limestone and labor at ruling prices, they cannot make Iron and realize a profit even at present prices. The few concerns here who do any puddling have their own particular furnaces from whom they get their Iron, some of them identified interests, and as a result very little Gray Forge Iron is changing hands. Several furnaces in this district that as a rule have been on Gray Forge right along have been unable to dispose of their product, and are now on Bessemer. The tone of the market is weak, and a good sized order for Bessemer or Gray Forge placed at this time would probably shade our lower quotations. We quote as follows:

Neutral Gray Forge.....	\$9.50 @	\$9.75, cash
All-Ore Mill.....	9.75 @	10.00 "
No. 1 Foundry.....	11.75 @	12.00 "
No. 2 Foundry.....	10.75 @	11.00 "
Bessemer.....	10.40 @	10.50 "

We note a sale of 2500 tons of Bessemer, equal deliveries in March and April, at a price equal to about \$10.50, Pittsburgh.

Ferromanganese.—We continue to quote \$52, delivered at buyer's mill, for 80 % domestic.

Billets.—Extreme quietness prevails, the market being almost bare of inquiries. However, the mills are fairly well fixed for business for the next month or two, while one maker is reported as being sold up for the next three months. Most of the Steel now being offered is from brokers, some of whom have evidently more than they can dispose of to good advantage. The market is represented by the quotation of \$15.50 at mill, while some of the mills refuse to go below \$15.75. One prominent buyer was here last week asking prices on 10,000 tons for Eastern shipment, but the purchase was not made.

Structural Material.—A fairly large order for Beams and Channels was taken by Pittsburgh last week at 1.20¢ at mill. As stated last week, there is much business in sight, but it is being closed at a very slow rate. For ordinary lots prices are unchanged and we quote as follows: Beams and Channels up to 15 inches, 1.25¢ @ 1.30¢, according to order; Angles and Universal Plates, 1.20¢ @ 1.25¢; Tees, 1.40¢ @ 1.50¢. Pittsburgh has recently offered Beams at a Western point of delivery at a price considerably below our lower quotation.

Plates.—The volume of business is considerably larger, some of the mills having more orders on their books at present than they have had for some

months. It was confidently expected that prices would have shown some improvement before this, but such has not been the case. Even buyers admit that prices cannot go lower, but should soon show improvement. Prices continue to depend largely upon the nature of the business. For ordinary lots the following quotations are ruling: Tank Steel, 1.20¢ @ 1.25¢; Shell, 1.35¢ @ 1.45¢; Flange, 1.50¢ @ 1.60¢; Ordinary Fire Box, 1.75¢; Railroad Fire Box, 2¢. A recent order for Tank Steel and Universal Plates, involving considerable tonnage, was taken by Pittsburgh at a price somewhat lower than our quotation.

Muck Bars.—We quote nominally at \$19.50 @ \$20 for best grades, delivered at buyer's mill. There is very little doing.

Bars.—The Bar Iron trade is in an extremely unsatisfactory condition, and this includes present demand, outlook for the future and prices. The volume of business has fallen off considerably of late, and when a good order does come along it is taken at such a low price that the mill that failed to get it is doubtless better off than the concern that booked the order. Reports are going of Common Iron Bars being sold as low as 1¢ at mill, although the Valley mills are understood to be holding out for 1.10¢ at mill. Soft Steel Bars are slightly lower, and we quote at 1.10¢ @ 1.20¢ at mill, with Bar Iron extras.

Wire Rods.—The famine in Wire Rods continues, none being offered. It is claimed that the entire output of Rods for the next three months is under contract.

Merchant Steel.—While the demand is better than it was a month ago it is still far from satisfactory. The implement makers have not commenced to send in inquiries, but are expected to before long. Prices are slightly weaker and we quote as follows: Bessemer Machinery, 1.40¢; Open Hearth Machinery, 1.60¢ @ 1.70¢; Open Hearth Spring, 1.70¢ @ 1.75¢; Toe Calk, 1.90¢; Machine Straightened Tire, 1.60¢; Sleigh Shoe, 1.85¢; Cold Rolled Shafting, 1.65¢ base.

Skelp Iron and Steel.—An order for some 2500 tons of Iron Skelp is in the market and will likely be placed this week. We quote as follows: Grooved Steel Skelp, 1¢ @ 1.10¢; Sheared Steel Skelp, 1.10¢ @ 1.20¢; Grooved Iron Skelp, 1.20¢ @ 1.25¢; Sheared Iron Skelp, 1.30¢ @ 1.35¢.

Pipes and Tubes.—The demand continues very light, and prices continue as low as ever. As noted elsewhere, the Oil Well Supply Company of this city have been taken out of the receiver's hands. The plants of the Elba Iron Works and Continental Tube Works, owned by this concern and idle since last summer, will not be put in operation until there is a material improvement in the Pipe trade. A hitch has occurred over the contract for 60 miles of Line Pipe for Canada, reported as being secured by an Eastern mill. The buyers demanded certain guarantees which the makers would not give, and the order is on the market again.

Wire Nails.—New business is somewhat light, but with the heavy orders booked during January and early in February the mills are comfortably fixed for the next month or two. The established price of \$1.05 at mill in carload lots is being maintained. There is a fair volume of business in Cut Nails, the price being maintained at \$1 @

\$1.05 at mill in carload lots. The Cut Nail factory of the Laughlin Nail Company at Martin's Ferry, Ohio, which is the largest Cut Nail factory in the world, containing 225 machines, resumed operations yesterday after an idleness of several weeks.

Barb Wire.—The demand continues fairly heavy, the mills having enough orders booked to cover their output for some time. The established price of \$2.15 for Four-Point Galvanized in carload lots is being sustained, while Painted is held at \$1.75 in carload lots. In Cleveland the market is represented as somewhat higher, \$2.20 being the ruling figure for Four Point Galvanized, at which price we note a sale of 500 tons, equal deliveries in February and March.

Connellsville Coke.—There is an improved demand for Furnace Coke, but prices are as low as ever. Since January 1, 1894, the weekly output in the Connellsville region has increased 20,500 tons, while the list of active ovens is also considerably larger. For the week ending Saturday, February 24, there were 10,099 ovens in the region in blast and 7414 idle, the total production for the week being estimated at 98,755 tons. Short time contracts for Furnace Coke have been made on the basis of 90¢, at oven. Foundry Coke is ruling at \$1.05 @ \$1.15 to consumers.

St. Louis.

(By Telegraph.)

Office of *The Iron Age*,
Bank of Commerce Building,
St. Louis, March 7, 1894.

Pig Iron.—There is no improvement to note in Pig Iron, either as regards prices or demand. Prices are shaded on most transactions and there appears to be no bottom to the market. No. 2 Foundry is nominally quoted at \$7.50, f.o.b. cars Birmingham, but has been shaded in a number of instances. The local demand is very light, foundries, stove works, &c., only working part time. We quote as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry.....	\$11.75 @	\$12.25
Southern Coke, No. 2 Foundry.....	10.75 @	11.00
Southern Coke, No. 3 Foundry.....	10.25 @	10.50
Southern Gray Forge.....	9.75 @	10.00
Southern Car Wheel.....	17.00 @	18.00
Lake Superior Car Wheel..	16.25 @	16.50
Ohio Softeners.....	1.25 @	15.50

Bar Iron.—An extremely dull trade is reported by both mills and jobbers and prices are weak and unsettled. The general mill quotation is 1.20¢, but it is intimated that this price is not being maintained. Jobbers ask 1.40¢ @ 1.45¢, according to quantity.

Barb Wire.—The improvement which has characterized this department for some weeks past continues and mills are away behind their orders. Jobbers are also enjoying an excellent trade and prices are firmly maintained. Mills quote \$2.05 for Painted and \$2.45 for Galvanized, in good sized lots, with 5¢ per hundredweight less for carload quantities.

Wire Nails.—There is some improvement in the demand for Wire Nails, but prices do not get any better. Mills ask \$1.20 @ \$1.25, while jobbers are selling pretty freely at \$1.30 @ \$1.35.

Rails and Track Supplies.—The same old story of no improvement has again to be repeated. In the absence of business of any note prices are un-

changed, as follows: Splice Bars, 1.40¢ @ 1.45¢; Spikes, 1.75¢ @ 1.80¢; Bolts, Square Nuts, 2.20¢; with Hexagon Nuts, 2.30¢. Links and Pins, 1.75¢ @ 1.80¢; Old Iron Rails are practically dead at \$12 @ \$12.50. Steel Rails, \$26 @ \$27.

Pig Lead.—During the past week this metal has improved somewhat and 3.02½¢ is quoted now. Sales are largely confined to carload quantities, and the large buyers are apparently out of the market for the present at least.

Spelter.—At 3.65¢ this metal is very strong and bids of less than this price find no takers. There is not much demand, but at the price above stated the market is strongly held.

Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fifth and Main Sts., CINCINNATI, March 7, 1894.

There has been no increase in the volume of business in Pig Iron during the week. There is a steady demand from the jobbing foundries in this district, but the orders seldom reach 300 tons in any one lot, and are more frequently for single carloads, and yet in the aggregate they compare favorably with either of the several preceding weeks. The orders from the East have not been large and have been freely met. The tone of the market continues weak, and buyers with the cash in hand could doubtless buy Iron as low as it has ever been sold. There is some inquiry for Charcoal Iron at the close, but mainly at lower prices than sellers are willing to accept. Iron Pipe works are still melting more Iron than most other interests but not as much as they have been for some time. The indications are that stocks of Southern Iron have increased during the past month, although not to any very large extent. There has been no quotable change in prices during the week, but it is evidently easy to buy at the low quotations current. Quotations are merely nominal, as follows:

Foundry.

Southern Coke, No. 1.....	\$11.00 @	\$11.25
Southern Coke, No. 2.....	10.00 @	10.25
Southern Coke, No. 3.....	9.50 @	9.75
Ohio Soft Stone Coal, No. 1....	14.50 @	15.50
Ohio Soft Stone Coal, No. 2....	14.25 @	14.50
Lake Superior Coke, No. 1.....	13.00 @	13.50
Lake Superior Coke, No. 2.....	12.00 @	12.25
Hanging Rock Charcoal, No. 1..	17.00 @	17.50
Hanging Rock Charcoal, No. 2..	16.50 @	17.00
Tennessee Charcoal, No. 1.....	13.50 @	14.00
Tennessee Charcoal, No. 2.....	12.50 @	13.00

Car Wheel and Malleable Irons.

Standard Southern Car Wheel	16.75 @	17.75
Lake Superior Car Wheel and Malleable.....	16.50 @	17.00

Forge.

Gray Forge.....	9.00 @	9.25
Mottled Coke.....	9.00 @	9.25

New York.

Office of *The Iron Age*, 96-102 Reade street, New York, March 7, 1894.

Pig Iron.—Current business is light, and no large contracts have been recently placed. An interesting fact is that Carrie, a Pittsburgh Iron which was quite well known in this market in past years, is again being offered. On the basis of Pittsburgh open quotations for Foundry Iron competition from that source in this market would be out of the question. No Pipe contracts of any consequence have been placed, except one lot of 600 tons for Warren, Pa. We understand that the East River Gas Company propose to lay a very large mileage of Cast Iron Pipe in this city this year. The company will order the Pipe in small quantities as required un-

less some satisfactory arrangement of a general contract with quick delivery on specifications for sizes is made. We quote standard brands \$13 @ \$13.50 for No. 1; \$12 @ \$12.50 for No. 2; \$11.25 @ \$12 for Gray Forge, at tide-water. Southern Iron, same delivery, \$12.75 @ \$13.25 for No. 1; \$11.25 @ \$11.75 for No. 2; \$11 @ \$11.25 for No. 3; \$11.25 @ \$11.75 for No. 2 Soft, and \$11.75 @ \$12 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is \$10.50 @ \$11.

Ferromanganese and Spiegeleisen. The market is dull, with domestic Ferromanganese \$51 @ \$51.50, tidewater, and foreign Spiegeleisen nominally \$21 @ \$22 for 10 %, and \$24.50 @ \$25 for 20 %, ex-ship.

Billets and Rods.—The market is dull. We quote \$18.25 @ \$18.75, tidewater, for domestic, and \$27 @ \$27.50 for foreign Billets. Domestic Wire Rods quoted at \$27.25 @ \$27.50, tidewater, while foreign are nominally \$39 @ \$40.

Steel Rails.—It is reported that the Long Island order, which was definitely stated to have been closed some time since, has only actually been placed lately. In the West, in standard sections, business is still flat. So far as known, Edgar Thomson took thus far this year the Huntingdon order for about 30,000 tons at extraordinary terms of payment, and the larger part of the Gould order of 50,000 tons, Colorado sharing in it. The C., B. & Q. order to the latter mill has been canceled. The Colorado and Illinois together have the Union Pacific and the latter has also a small contract for the Illinois Central. On the whole the business has been very meager thus far. Demoralization in the Light Rail trade continues, and \$24 @ \$27 is quoted, according to section. G-rder Rails are quoted \$25 at mill, equal to \$26.35 tidewater. A mill in Central Pennsylvania has taken the Dayton, Ohio, contract.

Track Material.—We quote as follows for small lots: Spikes, 1.70¢ @ 1.80¢; Fish Plates, 1.30¢ @ 1.40¢; Track Bolts, Square Nuts, 2.10¢ @ 2.40¢, and Hexagon Nuts, 2.30¢ @ 2.50¢, delivered.

Manufactured Iron and Steel.—The most important contract closed this week was for about 5000 tons of elevated and bridge work for elevating the tracks of the New York, New Haven & Hartford in Providence, R. I. At least a part of the contract has been taken by a large concern in Central Pennsylvania. In architectural work the New York Life extension and a new building on Twenty-third street have been placed, involving about 2000 tons. Nothing of any consequence has been done in Plates and Bars. We quote nominally: Beams up to 15-inch, 1.40¢ @ 1.50¢, for round lots; Angles, 1.35¢ @ 1.50¢; Universal Mill Plates, 1.30¢ @ 1.50¢; Tees, 1.60¢ @ 1.70¢; Channels, 1.45¢ @ 1.60¢, on dock. Steel Plates are 1.25¢ @ 1.40¢ for Tank; 1.40¢ @ 1.65¢ for Shell; 1.70¢ @ 2¢ for Flange, and 2¢ @ 2.50¢ for Fire Box, on dock; Refined Bars are 1.40¢ @ 1.9¢, on dock, and Common 1.25¢ @ 1.30¢; Soft Steel Bars are 1.20¢ @ 1.50¢; Scrap Axles are quotable at 1.35¢ @ 1.50¢, delivered; Steel Axles, 1.35¢ @ 1.50¢, and Links and Pins, 1.40¢ @ 1.60¢; Steel Hoops, 1.50¢ @ 1.70¢, delivered; Cotton Ties, 70¢ @ 72½¢ @ 45-lb bundle, at mill; Machinery Steel, 1.35¢ @ 1.50¢; Toe Calk, 1.90¢ @ 2¢, and Sleigh Shoe, 1.65¢ @ 1.75¢, delivered.

Metal Market.

Pig Tin.—Straits Tin for prompt delivery, in lots of 5 tons, has been sold and openly offered at 18.50¢ @ lb. Rumor has it that April delivery was sold at 18.25¢. Official records show that there were, at the least, offers to sell the latter at the price quoted. This shows distinctly a decline of no less than ¼¢ @ lb in prices during the past week. The conditions leading to this result are practically the same that have depressed the market for some time past; that is to say, heavy accumulation of stock in Europe; liberal shipments thence to this quarter (most of which remains in bonded warehouse pending Tariff legislation); free selling to consumers by more jobbers than one at prices closely in line with actual cost from day to day, and, last but not least, the decline that has taken place of about £1. 10/ @ ton in London prices during the week under review. Meanwhile purely speculative business has been conspicuous by its absence in this quarter. The only speculation, in fact, has been the closing up of old deals, and late "short" sellers seem to be about the only gainers. Consumptive demand, to all accounts, is rather behind the average for the season, yet remarkably good considering the condition of general trade.

Copper.—Business has not improved in this quarter and there is nothing in the way of negotiations that would indicate broader interest on the part of consumers, although reports come from reliable quarters that manufacturers of various lines of Copper and Brass goods are enjoying a better trade at present than they have for some time past. Sellers, or at least some of the producers' representatives, are offering in a very indifferent way, some refusing orders that call for deliveries prior to the opening of navigation. Enough supply comes out from one source or other to meet the demand and prices are quite as soft at the present time as they were a week ago. Lake Superior Ingot has been sold at 9½¢ @ 9¾¢, according to brand and size of lot. Electrolytic keeps about ¼¢ less and on ordinary casting stock 9¢ @ 9¼¢ is the range.

Pig Lead.—Prices have advanced a trifle and the market has gained somewhat in tone. The turn, however, does not appear to be due to any great revival in the demand in this quarter, although a few speculators have bid stiffly on forward deliveries. Restricted offering is the main basis of the strength of the market. In other words, there is no pressure of stock upon the market at the present time. Hence single carloads brought 3.30¢, while bids were made of 3.25¢ @ 3.27½¢, for prompt and near future delivery, without leading to business.

Spelter.—Except of moderate quantities there have been very few sales here and the general demand is slow despite more or less "bullish" accounts received from Western points. There is complete absence of speculation or anything bordering upon it. Prices stand at 3.85¢ @ 3.95¢ for ordinary Western brands, according to time of delivery and size of order.

Antimony.—Of jobbing parcels sales are fair, but otherwise there is little doing. Prices remain steady at about 8½¢ @ 9¢ for Hallett's and 10¢ @ 10½¢ for Cookson's.

Nickel.—The market is steady, with prices ranging between 45¢ and 55, as to size of lot and terms.

Tin Plates.—Little change, if any, has taken place in the character of business. The demand has been perfunctory and apparently governed by well defined wants. Offerings, while not particularly heavy, have sufficient weight to keep prices down to the level at which they have been for several weeks. For spot goods the following prices are quoted: Coke Tins—Penlan grade, IC, 14 x 20, scarce; J. R. grade, do., \$5.32½ @ \$5.35; Bessemer full weight, \$5.20 @ \$5.25; light weights, \$4.80 @ \$4.85 for 100 lb, \$4.77½ @ \$4.80 for 95 lb, \$4.60 for 90 lb. Siemens Steel scarce. Stamping Plates—Bessemer Steel, Coke finish, IC basis, \$5.45; Siemens Steel, IC basis, \$5.55 @ \$5.60; IX basis, \$6.60. Charcoals—Melyn grade, IC, \$6.35; Crosses, \$7.87½; Allaway grade, IC, \$5.50; Crosses, \$6.65; Grange grade, IC, \$5.60; Crosses, \$6.75. Charcoal Terne—Worcester, 14 x 20, scarce; do., 20 x 28, \$11.85; M. F., 14 x 20, \$7.25; do., 20 x 28, \$14.50; Dean grade, 14 x 20, \$5.35; do., 20 x 28, \$10.50 @ \$10.60; D. R. D. grade, 14 x 20, \$5.15; do., 20 x 28, \$9.90 @ \$10; Alyn, 14 x 20, \$5.35; do., 20 x 28, \$10.50; Wasters—S. T. P. grade, 14 x 20, \$4.75; do., 20 x 28, \$9; Abercarne grade, 14 x 20, \$4.60; do., 20 x 28, scarce.

C. Kirchhoff, special agent of the United States Geological Survey, has issued the following preliminary statement of the production of Copper in 1893:

	1892. Pounds.	1893. Pounds.
Lake Superior.....	123,108,480	113,144,141
Arizona.....	38,496,089	43,902,824
Montana.....	163,206,123	155,309,133
New Mexico.....	1,188,796	280,742
Colorado.....	7,693,674	7,095,826
Utah.....	2,209,428	1,135,330
California.....	2,950,944	239,682
Nevada.....	226,000	20,000
Idaho.....	.....	36,367
Washington.....	.....	39,785
Eastern and Southern States.....	467,448	532,793
Lead desilverizers, &c.....	5,491,702	7,456,838
Total domestic Copper.....	344,998,679	329,692,461
From imported Ores and Pyrites.....	8,277,063	7,723,367
Imports of Pigs, Bars, Ingots and Old.....	353,275,742	337,416,848
Exports of Ingots and Bars.....	354,828,257	342,952,538
Fine Copper contents of Matte exported, estimated.....	30,515,736	138,984,128
Re-exports, foreign Ore and Ingot.....	324,312,521	203,668,410
Available supply.....	66,000,000	50,000,000
	258,312,521	153,968,410
	2,982,149	2,019,821
	255,330,372	151,948,589

Reports of stocks of Copper from the producers and the majority of smelters, with the exception of the Calumet and Hecla, the Quincy and Anaconda mining companies, show a decrease from 44,227,564 lb on January 1, 1893, to 39,000,069 lb on January 1, 1894. All the lake companies, with the exception of the two named, report 2,629,943 lb on the former and 2,221,342 lb on the latter date, while Montana producers increased their stock from 8,544,092 lb to 8,967,548 lb. Arizona stocks stood 4,711,291 lb on January 1, 1893, as compared with 4,794,520 lb on January 1, 1894. In the absence of the stocks of the concerns alluded to no general conclusions are warranted.

James Stewart & Co. of St. Louis, Mo., have secured a contract to construct a \$1,500,000 draw bridge and belt railway at St. Paul. The bridge,

which will be at South St. Paul, is to be 2200 feet long, with four 150-foot spans and a draw span of 480 feet. It will be operated by the Burlington, the Milwaukee & St. Paul and the Chicago & Kansas City railroads.

Financial.

The week under review has been remarkable for a sharp recovery in stock market prices, and a revival of speculation in securities by the outside public, which have given new life to Wall street. While the news from Washington, including the passage by the House of the Bland Seigniorage bill and contradictory reports in regard to the prospects of tariff legislation, have not contributed to the strengthening of the market, encouragement has been drawn from other sources. Returns of railroad earnings have shown a marked improvement. Those of various companies reporting for the month of January exhibit such large economies in operating expenses as have materially reduced the net decreases in gross earnings. In some instances the reports even show an actual increase in earnings over those of last year. The steadying of the wheat market and more satisfactory reports from the various produce markets, together with the advance of the spring season and the consequent expectation of livelier trade conditions, have all helped to give a more hopeful and confident tone to the financial and commercial situation.

Moreover, favorable news in regard to the reorganization plans for the Erie and Richmond Terminal systems, as well as the settlement of the Speyer loan made by the Reading receivers, have exerted more or less of a favorable influence on the stock market.

The passage of the Bland bill caused a hardening of the sterling exchange market, followed by the engagement of \$1,250,000 of gold for export to Europe on Saturday. This movement seems, however, to have been an exceptional one, as the rate of exchange has not yet quite touched the point where gold exports can be profitably made. It has not been followed by any further outgo of the metal this week. So far, the export of gold since January 1 has amounted to \$5,527,070, and imports to \$2,205,781, leaving the net exports at \$3,321,289.

The weekly statement of the New York banks, published last Saturday, showed an average increase in cash of \$761,100, showing, with a gain of \$1,150,000 in legal tender notes, that the movement of currency toward this city still continues. Loans contracted nearly \$2,000,000, reflecting continued stagnation in business. The result of all the week's changes was a further gain of \$1,011,400 in the surplus reserve, which now stands at \$75,778,900 in excess of legal requirements, against \$6,503,125 in the corresponding week a year ago and \$21,292,225 at the same time in the preceding year. The changes in the corresponding week in three preceding years were made up as follows: 1893, loans decreased \$5,653,500, cash decreased \$5,557,600, deposits decreased \$10,703,800 and surplus reserve decreased \$2,881,650; 1892, loans increased \$7,792,300, cash decreased \$5,267,500, deposits increased \$1,639,900 and surplus reserve decreased \$5,677,475; 1891, loans increased \$941,900, cash decreased \$3,237,500, deposits decreased \$1,952,800 and surplus reserve decreased \$2,749,300. Subjoined is

Saturday's statement compared with the corresponding dates of the preceding two years:

	March 5, 1892.	March 4, 1893.	March 3, 1894.
Loans ..	\$483,675,300	\$452,917,400	\$439,803,400
Specie....	104,479,800	72,353,500	97,526,300
Legal tenders..	50,207,100	49,650,700	111,187,900
Deposits..	533,578,700	462,004,300	531,741,300
Circle of circulation.....	5,598,000	5,610,400	11,640,000

There still continues to be a glut of loanable funds in the money market, with extreme easiness in the rates for call and time loans. The former still rule at 1%, and although a rather better demand is noted for time accommodations, supposedly for investment buying, the rates are generally unchanged, being quoted at 2% for 30 to 60 days, 2½% for 90 days to 4 months, and 3½% @ 4½% for longer periods. Mercantile paper of a high grade is in active demand, but little paper of this character reaches the market, which is consequently dull. Rates are 3½% @ 3¾% for indorsed bills, 4% @ 4½% for best single named and 4½% @ 6% for others.

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, March 7, 1894.

There was an almost uninterrupted fall in prices until spot delivery went to £63. 16/3 and futures relatively as low. The decline was attributed to the depression in silver and pressure of Tin for sale by some importers who became alarmed at the heavy shipments from the East during the last half of last month. The statement showing that spot stocks increased only 200 tons served to restore confidence in some degree, and a recovery of 3/9 took place. Toward the close there were some indications that the lowness of prices is attracting attention and leading to freer buying. Latest quotations were £65 for prompts and £66 for three months' futures.

Copper was steady early in the week, but afterward rapidly declined, owing chiefly to the depression in Tin and the fall in silver. Speculators held aloof, owing to the uncertain future of the market. Chili Bars, prompt delivery, reached as low as £40, a decline of 17/6 for the week. Consumers have purchased moderately. European stocks increased 316 tons and the visible supply 357 tons during the last half of February. Sales of furnace material continue moderate. Last quotations were £40. 15/ for Merchant Bar prompts, £41. 2/6 for ditto futures and £43. 10/ for Best Selected English.

Tin Plate has remained quiet. Buyers and sellers are awaiting developments regarding tariff legislation in the United States. Some business has been done in Oil sizes at 3½ pence below late prices, but makers are now reluctant sellers at same figures. Liverpool prices are quoted as follows:

IC Charcoal, Alloway grade.....	12/3 @ 12/9
IC Bessemer Steel, Coke finish.....	10/6 @ 11/
IC Siemens.....	11/ @ 11/3
IC Coke, B. V. grade, 14 x 20.....	Nominal.
Charcoal Terne, Dean grade.....	10/3 @ 10/9

Pig Lead has been quiet and prices remain very steady at about £9. 5/ for Soft Spanish.

Spelter has reacted somewhat on rather better business, and the market is now fairly firm at £15. 12/6 for ordinary Silesian.

There is more activity in the Steel trade, chiefly in Rails and Ship Plates, but prices have undergone very little change. The Maryport Steel Works will probably start up soon. In the Iron trade business has been only fair, and the market still shows rather soft tone. Last sales of warrants were at 42/11 @ 43/ for Scotch, 36/ @ 36/1½ for Cleveland and 45/ @ 45/1½ for Hematite.

Washington News.

(From our Regular Correspondent.)

WASHINGTON, D. C., March 7, 1894.

The large fine paid by the Carnegie Company for the introduction of imperfect steel plates among those accepted by the Government created a decided sensation among naval experts, and the end is not yet. The counter allegation from Pittsburgh, that the Government paid 25 per cent. of the assessment to informers and conspirators, has also created considerable excitement in official quarters, and after several conferences in the highest naval circles, the matter has been held in abeyance until the President can be consulted, as he was the immediate power in mulcting the Carnegie Company the \$140,189 for furnishing plates which, speaking officially, were "good, all excelling the lowest limits of tolerance in the specifications, yet portions of which were not up to the highest possible mark of excellence, which, by their contract, the company were bound to attain."

The charge of conspiracy made by a newspaper in defense of the company and the discussion of the offense for which the fine was levied will bring about one of the fiercest contests in which the Navy Department has been engaged for some time.

The 12 13-inch guns which were ordered for the battle ships are rapidly nearing completion. Of the whole number ten are now ready to be placed on the ships whenever required, and the remaining two will be ready in time.

In conversation with Commodore Sampson, Chief of Ordnance, that expert on such subjects remarked: "It is not probable that any more 13-inch guns will be made. They are large and unwieldy and cannot be made as effective upon the whole as a gun of less caliber more easily and rapidly handled. The days of excessively large guns seem to be numbered as far as naval uses are concerned. They are unwieldy aboard ships and seriously affect their stability, it is claimed by experts in construction." It has been decided to make the largest guns on the battle ship "Iowa" of 12-inch caliber, and this will be the limit of caliber for a battle ship constructed in the future.

The test of the 13-inch gun, which has been awaited with so much interest by experts in military and naval circles, will still be delayed about two weeks on account of the steel trucks. It is the purpose of the Chief of Ordnance to give it every advantage of the best equipment in order to make the test

thoroughly scientific as well as practical. The enormous weight of the gun necessitates the use of steel trucks for absolute safety in transportation.

The official figures connected with the 13 inch gun are enormous. It is 40 feet long, 4 feet across the breech, 21 inches at the nozzle, weighs 135,000 pounds, or about 60 tons. The projectile weighs 1100 pounds, the charge 550 pounds. The velocity is 2100 foot seconds. The muzzle energy 33,625. A battery of these guns will be placed on the battle ships "Oregon," "Massachusetts," "Indiana" and "Iowa."

On April 1, 1894, a larger number of vessels of the new American navy will go into commission than has certainly been the fact in the history of naval expansion in the United States and almost with equal certainty in the naval history of any nation. The list comprises the "Columbia," "Cincinnati," "Raleigh," "Montgomery," "Marblehead" and "Atlanta." This in itself makes a powerful fleet of the fastest and most efficient cruisers in the world.

The construction work in the new navy is now all under way, and will soon be exhausted if the present Congress does not authorize some additional ships. The battle ship "Iowa" and cruiser "Brooklyn" are on the stocks and all the other vessels are in the water.

The stability question, which has been occupying so much attention in naval circles, will be given a practical investigation in the case of the battle ship "Indiana" which will be the first of her class given a sea trial. Chief Constructor Hichborn has been giving the subject the closest scrutiny in calculations. He informed the correspondent of *The Iron Age* to day that the ordnance weights of the battle ships largely exceed the weights of the same for the cruisers and that this disproportion is not confined to American naval vessels of that class, but also to foreign ones. "In the case of the battle ships 'Indiana,' 'Massachusetts' and 'Oregon,'" said Chief Constructor Hichborn, "these weights are greater than any ship afloat, especially in relation to displacement and draft. This defect is not due to design. I believe in adapting these weights to the other figures of the ship and there will be no top heaviness."

Pittsburgh Freight Rates.

(By Telegraph.)

Taking effect on Monday, March 12, next, rates on iron and steel articles, pig iron articles and billet articles, in carload lots from Pittsburgh and points taking Pittsburgh rates, to points named below, will be reduced, the new rates being as follows:

	Iron and steel articles.	Pig iron articles.	Billet articles.
Chicago	\$0.11	\$2.70	\$2.10
St. Louis .....	.13	2.25	2.35
Cincinnati .....	.09	1.80	1.80
Indianapolis .....	.10	1.90	2.00
Cairo, Ill. ....	.15	2.60	2.60
Detroit .....	.09	1.75	1.80
Dayton .....	.09	1.60	1.70
Joliet .....	.11	2.00	2.10
Milwaukee .....	.13	2.40	2.50
Toledo .....	.08	1.50	1.60
Peoria, Ill. ....	.12	2.15	2.25
Anderson, Ind. ....	.10	1.90	2.00
Muncie, Ind. ....	.10	1.90	2.00

The reduction in freight rates in car load lots to these points has been made necessary by the fact that rates from Cleveland to the above places have recently been reduced, said reductions being largely brought about by the fact that cut rates from Cleveland have been prevailing for some time.

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HARDWARE.

Condition of Trade.

THERE IS A GOOD DEAL of unevenness in the demand for Hardware and kindred lines, and some manufacturers report business relatively much better than do others. There is also considerable divergence in the reports of jobbing houses in different sections of the country. Some lines of goods are still moving sluggishly, but in others there is a perceptible increase in the demand. On the whole business may be referred to as showing signs of improvement, and the trade are placing orders more frequently. The demand is beginning to set in more freely from the retailers, whose orders are more diversified than they have been. Trade, it is thought, will show a marked increase with the approach of spring, and it is hoped that a fair if not a good business may be done during the next few months. Prices do not show any increased strength, and the tone of the market is rather toward lower quotations. The quotable changes are, however, comparatively few, but concessions from regular prices are more readily obtained by close buyers.

Chicago.

(By Telegraph.)

The Shelf Hardware trade has experienced a notable improvement since our last report. The largest houses here state that their mail on Monday was the heaviest they have received so far this year. Every day recently has shown some gain. The changed character of the demand reported last week continued to be a conspicuous feature. While the demand for Nails and other staple goods is less than it has been, the trade in small goods and in straight Hardware is improving decidedly and business is thus gradually broadening to the satisfaction of jobbers. More new stocks have recently been bought, showing that additional stores are being opened in different parts of the Northwest, where the opportunities appear to be inviting for new ventures of this character. Heavy Hardware jobbers report that their total sales for February showed a slight gain for that month over January. The condition of business is thus shown to have been somewhat better than was expected during the month. The demand at present is moderate but not strong. Wagon stock is moving considerably better, but carriage goods are neglected. Collections have not been up

to the average for the last two or three weeks, but are showing signs of improvement.

St. Louis.

(By Telegraph.)

The spring demand has not as yet set in very strong, but from the inquiries received and advices from traveling men it will be fairly large. Retailers continue to follow the policy they adopted last summer of buying only as their absolute needs require and even the offer of cut prices fails to induce them to change this mode of trading. Prices in many lines are being shaded, and in some cases are practically demoralized. This latter statement is particularly applicable to Axes, which are now being offered at prices heretofore almost unheard of; so low, in fact, that one house are endeavoring to lay in their entire year's supply. Screws and Carriage Bolts are also being sold at prices which are anything but satisfactory to the manufacturers. The Hardware jobbers have about concluded that the last half of the year will be the time for heavy trading, as dealers are now undecided whether to place their orders or not. Should the crops be large and railroads see their way clear to purchase equipment and make necessary repairs, there is a chance for a heavy fall trade. Collections are excellent.

Notes on Prices.

Wire Nails.—The Wire Nail market continues in excellent condition and prices are well maintained. Nearly all the manufacturers are fully occupied on orders, and some complaint is made that Nails cannot be obtained as promptly as desired. The market is represented by the quotation of \$1.10 for carload lots at factory, but on especially large and attractive orders a concession of 5 cents is made. On the other hand, some manufacturers are holding Nails at \$1.12½ to \$1.15.

Chicago, by Telegraph.—Manufacturers' agents report that they are not pushing their customers for specifications for Wire Nails; the mills are sufficiently busy on orders coming in to make this unnecessary. In fact, complaints are being received from merchants who have contracts with the Wire Nail factories in this locality that they are not receiving shipments fast enough. One mill is known to be at least a month behind in its deliveries. Inquiries have fallen off, but there are some large buyers who would take in additional quantities at old rates if they were able to induce manufacturers to accept such terms. The jobbing trade

is inclined to quietness, but that is because the retailers are now stocked and waiting for the demand for those who drive the Nails. The advent of spring weather is expected to cause a rapid growth in this demand in the course of the next week or two. A decided increase in business is reported by manufacturers of Wire Tacks, who have been meeting with great success in the introduction of such Tacks to the favor of the trade. Prices on factory lots of standard Wire Nails are continued at \$1.20, Chicago, while small lots from stock are selling at \$1.25.

Cut Nails.—The Cut Nail market has not developed any specially new features, the condition being substantially as for the past few weeks, with perhaps a slight weakening in the tone of the market. Manufacturers in the East are still adhering to their policy of quoting only prices for Nails delivered, and are naming \$1.05 for carload lots, on dock, New York, but it is rumored that this figure has been shaded. The price from store in New York is steady at \$1.15.

Chicago, by Telegraph.—The volume of business in Cut Steel Nails is gradually growing larger. The manufacturers report continued sales in directions in which Wire Nails had until recently almost taken absolute control of the trade. This is true not only of the city trade, but also of localities in the country in which sales of Cut Nails had for some time fallen to very small proportions. The jobbers who have placed good sized contracts are sending in specifications promptly, showing that Nails are needed to supply the wants of the trade. Quotations on factory lots are unchanged at \$1.05, Chicago, for 60-cent average. Small lots from stock are selling at \$1.15 to \$1.20.

Barb Wire.—The Barb Wire market is steady, with a good volume of business. Quotations for carload lots of Four-Point Galvanized are as follows: Pittsburgh, \$2.15; Cleveland, \$2.20; Cincinnati or Allentown, \$2.25; Chicago or New York, \$2.35. An advance of 5 cents per 100 pounds is made on carload lots.

Chicago, by Telegraph.—The Barb Wire manufacturers are now engaged in the pleasant work of staving off deliveries, as they seem to be sold so far ahead that their customers are generally complaining about the non-appearance of goods in time promised. Some large buyers are endeavoring to secure shipments which were promised in April, claiming that they need a very much larger quantity than they had antici-

pated when they placed their orders. Small lots of Galvanized Barb Wire are quoted at \$2.40, and carload lots at \$2.30.

Household Specialties.—The following are the prices announced by Silver & Co., 304 to 310 Hewes street, Brooklyn, and 20 Warren street, New York, on their line of kitchen furnishing goods and household inventions, as shown in their catalogue of February, 1894. The jobbing prices announced are only given in consideration of an order for at least three dozen of a kind. Terms, f.o.b. New York and Brooklyn, cash in 30 days, with 2 per cent. discount for cash in 10 days:

Presses.		
	Whole-sale.	Job-bing.
Upright.....Per doz..	\$7.00	\$6.00
Hand.....	3.00	2.50
Extra cups.....	1.00	.78
Beef Tea.....	3.50	3.00

Roasters, Royal.		
No. 1.....Per doz..	\$1.00	
No. 2.....	1.25	
No. 2½.....	1.35	30 %
No. 3.....	1.50	and 10 %
No. 4.....	1.75	
No. 5.....	2.50	

Roasters, Crown.		
No. 1.....Per doz..	\$0.65	
No. 2.....	.75	
No. 2½.....	.90	30 %
No. 3.....	1.00	and 10 %
No. 4.....	1.15	
No. 5.....	1.50	

Roaster Display Stands, each ..	\$5.00	\$5.00
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Marion Harland Pots.		
Tin Plate, Nickel Plated.		
1 quart.....Each..	\$0.90	
2 ".....	1.20	33⅓ % 33⅓ %
3 ".....	1.45	
4 ".....	1.65	

M. H. Pots, Copper.		
With Without Indica-tors.		
1 quart, each ..	\$1.75	\$1.45
2 ".....	2.25	1.85
3 ".....	2.50	2.10
4 ".....	2.90	2.40

Repairs, dozen Covers, \$1.20; Fitters, \$3; Strainers, \$1.20; Wire Cloth, \$1.20; Glass, \$1.20.

M. H. Coffee Urns		
With Without Indica-tors.		
2 quarts, each ..	\$4.50	\$4.00
3 ".....	5.50	5.00
4 ".....	6.00	5.50

One Cup Urns.....Per doz..	\$3.25	\$2.75
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Egg Beaters.		
S. & Co.'s New.....Per doz..	10.00	9.00
Jars only.....	3.25	3.40
M. G. Beater.....	5.50	4.95
Jars.....	3.25	3.00

Egg Timers.....Per doz..	2.00	1.80
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Sir H. D. Toasters.		
Small.....Per doz..	2.50	2.00
Large.....	2.75	2.25
Lamp Chimney Stoves, per doz..	.75	.60
Potato Peelers, Rapid, per doz..	.50	.40

Silver Flour Bins.		
25 pound.....Each..	2.25	1.75
50 ".....	3.00	2.50
100 ".....	3.75	3.25

Pyramid Cookers.		
No. 1.....Each..	1.50	1.25
No. 2.....	2.00	1.50
No. 3.....	2.25	1.75

Cooking Crocks.		
1 quart.....Per doz..	4.00	3.50
2 ".....	4.50	4.00
3 ".....	5.25	4.75
4 ".....	6.50	5.75

Egg Poachers.		
3 Egg.....Per doz..	2.10	1.80
6 ".....	4.00	3.60

Odorless Kettles, 12 quart..Each..	2.00	1.50
Bathtub Seats.....	1.00	1.00
New Process Press.....Per doz..	5.00	4.50
Glass Rolling Pins.....	4.25	3.75

Baby Cleveland Lamps, per dozen.....	4.25	3.75
Family Measuring Glasses, per dozen.....	.78	.65
All Glass Squeezers, per dozen.....	1.50	1.30
No. 56 Squeezers, per dozen.....	.75	.60

Boss Coat Racks.		
Brass.....Per doz..	4.00	3.50
Nickel Plated.....	2.50	2.25
Japanned.....	1.25	1.10

Sanitary Sink Baskets, per dozen.....	3.50	3.00
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Soap Cups.		
No. 1, Large, gal.....Per doz..	1.25	1.00
No. 1, jap.....	1.00	.75
No. 1, Small, gal.....	.90	.75
No. 1, jap.....	.75	.60

Novelty Cups.		
Galvanized.....Per doz..	2.50	2.00
Japanned.....	2.00	1.75
No. 2, tinued.....	2.25	2.00
No. 3, ".....	4.00	3.50

Automatic Gas Lighting Burners, per dozen.....	4.25	3.75
Yankee Roach Traps, per dozen.....	2.25	2.00

Alcohol Stoves.		
Queen.....Per doz..	7.00	6.00
Silver.....	4.70	4.00
French Process.....	4.25	3.75
Rapid.....	4.25	3.75
Pocket.....	2.00	1.50
Kettles.....	1.00	1.00

Heaters.		
Vim Stoves.....Per doz..	1.50	1.20
Globe Heaters.....	9.00	9.00
Burner Stands.....	2.50	2.25

No. 1 Oil Stoves.		
No. 1, single.....Per doz..	21.00	21.00
No. 1, double.....	42.00	42.00
No. 1, X tops, single.....	5.00	5.00
No. 1, double.....	9.00	9.00

No. 1 Radiators.....Per doz..	7.20	7.20
Best Broilers.....	6.00	5.50
No. 1 Oil Stove Ovens.....	15.00	15.00
Fire Cones.....	1.20	1.20

Silver Gas Stoves, Nickel Plated.		
No. 1, polished, with cock, per dozen.....	9.00	9.00
No. 1, with nipple.....Per doz..	5.00	5.00
No. 2, nickel plated.....	15.00	15.00
No. 3.....	21.00	21.00

Rapid Gas Stoves.		
No. 1, with cocks.....Per doz..	12.00	12.00
No. 2, black iron.....	24.00	24.00
No. 3.....	34.00	34.00

Novelty Gas Heaters.		
No. 1.....Each..	5.60	4.80
No. 2.....	4.20	3.60
No. 3.....	2.80	2.40

Ruby Globes (Net Prices).		
No. 1.....\$0.50	No. 2.....\$0.75	
No. 3.....\$1.00 each.		

Ruby Globe Oil Heaters..Each..	5.60	4.80
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Mammoth Egg Whisks.		
No. 10.....Each..	8.00	8.00
No. 15.....	10.00	10.00
No. 20.....	12.00	12.00

Silver Cookers, 10 gallon, each..	7.50	7.50
Westminster Stretchers, per dozen.....	12.00	9.60
Cigar Savers, per gross.....	12.00	9.60
Sauce Pan Stands, wrought iron, each.....	3.00	2.75

B. & O. Sure Grip Foot Vise—This Vise was described in a recent issue, and is manufactured by Butts & Ordway, Boston. It is sold to the trade at \$10 net.

Liberty Bell Match Safe.—This article is made by the Enterprise Mfg. Company of Philadelphia, and was described in our last issue. The Match Safe is sold to the trade at \$6 per dozen, subject to a discount of 20 per cent.

Liberty Bell Inkstand.—Enterprise Mfg. Company, Philadelphia, are putting this article on the market, and are selling it to the trade at \$8 per dozen, subject to a discount of 20 per cent. The Inkstand was described in our last issue.

Hay Fork Block.—Hariz Steel Hay Fork Block, manufactured by H. D.

Edwards & Co., Detroit, Mich., and illustrated in *The Iron Age*, February 22, 1894, is sold at \$2.40 per dozen net.

Sash Balances.—Pullman Sash Balance Company, Rochester, N. Y., issue the following revised price-list of Pullman Side and Top Balances, which is subject to a discount of 60 per cent.:

No.	Weight of each Sash. Pounds.	Hight of each Sash. Inches.	Per set.
0	4 and 5	30	\$2.40
1	6 " 7	30	2.40
2	8 " 9	30	2.60
3	10 " 11	46	2.80
4	12 " 13	46	3.10
5	14 " 15	46	3.40
6	16 " 17	46	3.70
7	18 " 19	46	4.00
8	20 " 21	46	4.70
9	22 " 23	46	5.00
10	24, 25, 26	54	5.30
11	27, 28, 29	54	5.50
12	30, 31, 32	54	5.70
13	33, 34, 35	54	5.90
14	36, 37, 38	54	6.10
15	39, 40, 41	54	6.70
16	42, 41, 46	54	7.25
17	48, 50, 52	54	9.25
19	54, 56, 58	54	10.00
21	60, and 62	54	10.50
23	64 " 66	54	10.75
25	68 " 70	54	11.00
27	72 " 74	54	11.50
29	76 " 78	60	12.00
31	78 " 80	60	12.50
33	82 " 84	60	13.00
35	86 " 88	60	13.50
37	90 " 92	60	14.00
39	94 " 96	60	14.25
41	98 " 100	60	14.50

Referring to the change in prices on these goods, the manufacturers remark, in a circular letter to the trade, that they consider it best to use a high list and a large discount in order that dealers may be given an opportunity of realizing more margin of profit than by using a low list and small discount.

Glass.—The first week in March has not witnessed any strengthening in Glass prices, although some improvement is noticed in demand. It is reported that there has been a decrease in the productive capacity of the country during the past week, equivalent to 24 pots. Many of the factories which have gone out of operation have no stock of Glass on hand and are dependent upon those in operation to fill immediate orders. Other factories are quoting Glass for delivery up to July 1, which is the regular time for closing all factories for the summer. Pittsburgh quotations remain unchanged at 85 and 10 and 5 per cent. discount for single and 85 and 20 and 5 for double strength Glass. It is understood that single strength Glass has been quoted at 85 and 10 and 7½; and that for immediate shipment 88 and 89 per cent. discount has been quoted for single and 90 per cent. discount for double strength. New York prices for French Window Glass are represented by a discount of 80 to 80 and 20 per cent. discount, and French Plate by 75 and 10 and 5 per cent. discount.

Hardware Club of New York.

THE ANNUAL MEETING of the Hardware Club of this city will be held on Saturday, March 17, in the parlors of the Cosmopolitan Hotel, Chambers street and West Broadway. Besides transacting such other business as may come before the meeting, five governors will be elected to succeed the following, whose terms of office will have expired: Eugene Bissell, Thomas F. Keating, J. H. Kennedy, J. L. Varick and R. R. Williams.

Prize Competition.

Bicycles in the Retail Hardware Store.

BY E. C. COLE.

Their Desirability.

AFTER an experience of seven years in retailing Bicycles in connection with a general stock of Hardware, Stoves and House Furnishing Goods, we can say that we consider the Bicycle as important a factor in our business as the Vapor Stove, the Refrigerator or the Cook Stove. In fact, if handled properly, it can be made as profitable as any specialty sold by the trade. We have always believed in a future for the Bicycle, even in the days of the old ordinary, and our belief is being realized from the fact that last season no single line in our business proved as profitable as our Bicycle department. The Bicycle is a

Seasonable Article,

and with the constantly increasing competition, it seems to us that the special Bicycle dealers will eventually have to succumb to the regular trade, as an article so seasonable as the Bicycle cannot always be made to pay profit enough in the four months selling season to maintain a business for the whole year. The bulk of the trade usually comes in March, April and May, somewhat earlier than the Vapor Stove trade and the other summer specialties—a good time for the Hardware dealer, as much of the preliminary work of showing and talking up the wheel to prospective purchasers can be done before the spring trade is at its height.

Repairs.

Every Hardware and Stove dealer has to maintain a repair shop, and Bicycle repairing can be made much more profitable than repairing Tinware or Gasoline Stoves, nor is it necessary to pay an expert repairer high wages, as some dealers seem to think; but the difficult repairs should be sent to the factory.

The Bicycle

is a specialty much like the Vapor Stove, and comes in more naturally with the Hardware line than with any other. The goods are not too bulky, and can easily be displayed with spring and summer goods, helping take the space occupied by heating and cook Stoves during the fall months. A good Bicycle trade will make the Hardware and Stove dealer's spring trade nearly equal to fall trade, thus balancing the year and helping to furnish profitable employment for the shop men during part of the dull season in July and August.

Difficulties in the Way.

Bicycles run into money fast, and while a good margin and a good net

profit can be made, it is necessary to use care to make sales to a class of customers that will pay as they agree. Most wheels have to be sold on the installment plan, if one desires to do much of a business. If a wheel is sold on too small a cash payment, with big promises for the balance, the dealer will generally find at the end of the season that he will have to settle with his customer by taking back the wheel, which, owing to improvements and the lowering of prices, may not be worth next season half what the dealer has invested in it. Many of the trade have had experiences of this kind that have thoroughly disgusted them with the Bicycle business. Bicycles, like Vapor Stoves, easily get out of order and need some attention after being sold. There are tire punctures, defective bearings, defective tires and numerous other complaints, all of which come back to the dealer to be settled. It is one of the great drawbacks to the trade, in the eyes of inexperienced dealers. The way in which we look at that point is this: real defects are made good by the manufacturers, and we merely stand between them and the rider. Imaginary defects must be dealt with by keeping posted in the business and by explaining to the customer what he can reasonably expect his wheel to stand and what he cannot. We figure on a profit sufficient to pay us for all extra annoyance in these matters, which is a necessary part of the business. Where we do work, or replace parts broken by accident or misuse, we charge for it, and when we sell a wheel we do not so interpret the guarantee to our customer as to lead him to believe that we repair everything that may happen to his wheel during the year free of charge.

Exchanging Machines.

We do not do any more trading than we can help, and when we do take an old wheel in part payment we are sure not to allow more for the old style wheel than we can resell it for at a profit. We use the lease plan—a very good one for securing deferred payments on wheels. Some, however, prefer a chattel mortgage. We insist upon at least 33½ per cent. of the purchase price down. If the customer is a clerk or some one with a good steady job, we make the monthly installment as high as he can stand, always figuring to get out in six months, or before the riding season is over. By especial care in selecting our customers we were enabled the past year to do a good business, selling over 100 wheels of all kinds, and to-day we have, not an old returned wheel in stock, and not over \$50 still due on last year's business.

When the Riding Fever.

is at its height there are a lot of young fellows who will do anything to get wheels, without any hope or prospect of paying for them; these dealers should look out for. Another drawback may be mentioned, which is the

constant changes and improvements in wheels, making the old styles nearly worthless. Even when little used the ordinary wheel, that sold for \$135 six years ago, would hardly bring \$30 to-day. These same improvements have, however, had the effect of making a staple business of what was a very risky one in the days of the ordinary. It seems at present that future improvements will not affect the values of present stocks as much as in the past. The question of general design is the same, the question of weight can be changed but little from the present. The improvements of the future would seem to lie in minor details principally. It is, however, advisable for the dealer to figure on selling all his stock every year, and in using caution in taking hold of wheels that vary much from the old established lines which have been thoroughly tested.

The Assortment

must depend on the size of the place and the condition of trade. Where a great many wheels are being ridden every year, the successful dealer must carry a representative line. He must have wheels at all prices, for all ages and for both sexes, and as no one concern builds a complete assortment of wheels, it is impossible to confine purchases to one line. We select the best youth's line from one maker, provided they meet our views on prices and improvements, and everything depends upon having the latest—a last year's wheel is like a last year's bird's nest. Next we want a good medium priced wheel. Then we must have a line of wheels for the trade who desire the best. No matter how good a wheel may be, or how perfect in our estimation, some rider or purchaser may object to the kind of tire or saddle, so we find it advisable to sell more than one high grade wheel, selecting so as to cover the desirable features in tires, and in what the trade seems to demand.

The Trade is a Fickle

factor as a rule, varying in its wishes and depending for its information upon what it has seen and used. But still it is to be humored by the successful dealer and not dictated to. The would be purchaser generally gets pointers about buying from some more experienced rider. If he wants a clincher tire, have it for him don't lose the sale to a competitor by trying to talk him into buying a cemented tire. In small places the trade will depend largely upon what the dealer makes it. If he can get one good wheel started, that will be what they will all want. A variety in the assortment is as necessary in Bicycles as in Stoves. One should be able to meet all the demands of the trade.

Bicycle Sundries.

Where the trade is well established a line of Bicycle sundries is quite necessary and fairly profitable, but many high priced patented articles should be dealt in lightly until one knows what the trade will buy. Locks, re-

pair outfits, lubricants, bells, whistles and trouser guards are the staple sellers in this line.

One Line of Wheels.

It is a bad thing to handle too many kinds of wheels in the same grade. They are like Stoves in that respect. Do not at any rate handle more lines or more makes than will fill the assortment you propose to carry.

The repair question will be greatly complicated by multiplying the makes of wheels. We don't confine ourselves to any one manufacture, but try to choose those that are likely to be in the greatest demand; at the same time we confine ourselves to just as few makes as possible. The business is constantly changing, and must be closely watched to keep up with it.

To Stimulate the Trade.

People, much like sheep, will follow the leader. If you can get a society leader to ride a wheel, others of his or her set will want to ride, too, on the same kind of a Bicycle. It is the same with business men; let two prominent business men take to Bicycling, either for health or as a pastime, and others are sure to follow. The same rule applies to professional men, mechanics and artisans. From this dealers can draw their own inferences as to possible means of stimulating trade in their own localities. It is well sometimes to take some extra risk in getting the right man on a wheel, although this feature is often carried far to extremes by the trade. In some cities I have known of firms trading a new high grade machine with some desirable rider for some old trap they did not expect to get half out of, just to get his influence, but I have rarely found this to repay the dealer to any great extent. Many physicians are recommending wheels to their patients who need exercise. Something might be accomplished in this line if it is rightly managed.

Bicycle Clubs

are a very good means of stimulating trade, especially in the newer districts. It is well to stand in with the local club, though we have never seen much direct benefit from so doing. Club men are, as a rule, supplied with wheels, and the best trade comes from the new riders. The Bicycle is fast becoming something more than a plaything. Its greatest future lies in the possibility of its use in place of the horse, the street car or other means of locomotion. It is being used by thousands of clerks and artisans in place of the horse. We know of a lady clerk who is using her wheel right through the coldest weather as a means of transit from her work to her home.

The Repair Shop.

It is necessary for the dealer to do a certain amount of repairing. This is not half so bad nor so complicated as

with Gasoline Stoves. It needs only to be looked at in the right light to be rid of its formidable aspect. We have a brazing outfit, but would not advise other dealers to put one in, as we do not use it. Almost all the repairs are those that any tinker can do with a little experience, and the whole question of tire repairs is as easy as soldering Tinware.

The next thing in importance is putting in spokes and straightening bends. All this can be made more profitable than any other part of the tin shop. Where frames break or parts break, like cranks or other forgings, the thing to do is to order duplicate parts of the maker. If the break is the result of a flaw the factory will furnish the part free, your customer will pay the express and you will furnish the time for replacing.

If caused by an accident charge well for your time and material.

About 25 Per Cent.

of repair work will have to be done free of charge, but the other 75 per cent. can be made to pay a handsome profit on the whole.

No special tools are required. Keep a stock of tire cement and tire repair rubber and an assortment of balls and spokes, and with the ordinary tinner's tools the rest can be done.

We have a growing belief in the future of the Bicycle, and that the Hardware trade is the place for it.

Prize Competition No. 28.

Bicycles in the Retail Hardware Store.

THIS COMPETITION, which closed February 17, has elicited a large number of contributions from the trade, many of which are of much interest and value, containing as they do suggestions and points in regard to the handling of this line of goods, which will be of service not only to those already pushing them, but to other merchants who are contemplating the addition of this department to their business. The more valuable papers will be given place in our columns as opportunity presents. On another page we print the contribution to which the first prize has been awarded. The committee to whom the examination of papers was intrusted have awarded the prizes as follows:

First prize, E. C. COLE, Council Bluffs, Iowa.

Second prize, HENRY C. WISEMAN, Springfield, Ohio.

Third prize, LOUIS H. HALL, Milford, N. H.

Eaton, Cole & Burnham Company.

EATON, COLE & BURNHAM COMPANY, who last year went into the hands of receivers, have made a proposition to their creditors which contemplates payment in full,

with interest, extending over a period of three and a half years. This offer has been accepted and the receivers, E. G. Burnham of Bridgeport, Conn., and E. H. Cole of New York, were, March 3, discharged by Judge Townsend of the United States District Court at New Haven, Conn.

Manufacturers' Club of Kings and Queens Counties.

ANOTHER STEP has been accomplished in a movement recently inaugurated, which seems to be assuming significant proportions, among the manufacturers of Brooklyn, but really covering all of Kings and Queens Counties, N. Y. Tuesday evening, March 6, a second meeting was held in one of the large rooms of the Union League Club on Bedford avenue. At this assembly were about 100 influential members of leading manufacturing interests of the two counties. This meeting was to perfect an organization having for its prime object the welfare of the manufacturers and employees in the territory mentioned, to be incorporated under the laws of the State of New York, and known as the Manufacturers' Club of Kings and Queens Counties. There will be social features also, enabling members to know each other who have heretofore transacted business largely by correspondence. A home for the club will be considered later.

A committee of 30 on organization, of which Lowell M. Palmer was chairman, appointed February 20, submitted a comprehensive and voluminous constitution and by-laws modeled largely after those governing the influential Manufacturers' Club of Philadelphia. Henry B. Haigh of Iron Clad Mfg. Company presided, and James T. Hoile, president of Willard Mfg. Company, acted as secretary. With a few minor changes, the by-laws were adopted, a committee of six, including one lawyer, being appointed at the same time to go over the draft carefully for the purpose of correcting any possible errors of punctuation, orthography, grammar or palpable inconsistencies. The Committee on Nominations reported in favor of a president and two vice-presidents, with a board of governors or trustees, numbering 24. For president Lowell M. Palmer was named, Henry B. Haigh for first vice-president, and W. H. Nichols for second vice-president.

With regard to the governors, it was thought wisest to name the sub-committee of five on organization as trustees, to which a lawyer was added, for the purpose of promptly securing a certificate of incorporation. Then, after the names of those present, together with the names of the concerns represented and kind of goods made, had been ascertained, a list of 48 or 50 could be made from which to select the Board of Governors so that all interests would be fairly represented.

Manufacturers have come to realize that much can be done as a body in the way of guarding against inimical legislation, &c., and in other ways protecting the interests of manufacturers. Mr. Palmer stated that Brooklyn was the second manufacturing city of the United States. He also said that, quoting from official figures for the last four years, 55 per cent. of the total west bound tonnage of the port of New York had been shipped from between North First and North Tenth streets on the Brooklyn river front. The absence of suitable and proper legislative support, high taxation, excessive insurance rates and other annoyances and restrictions were more or less discussed. The inference was that producers had come to realize the necessity of organization for mutual protection of their own interests, as well as those of their employees. It was stated that several large manufacturers had intended to establish extensive works in Brooklyn, but that subsequent investigation regarding taxation, &c., had caused them to locate elsewhere. It was argued that all such enterprises driven from Brooklyn increased the expense of doing business to those now there. Another speaker instanced a conversation with an acquaintance urging him to locate in Brooklyn, but investigation showed, among other things, that every express package originating there in a day's business lay over night somewhere down in Bergen street. The recent introduction of a bill in both branches of the Legislature at Albany, providing for a State boiler inspection, was viewed as only another hindrance, inasmuch as the city already makes such an inspection, while insurers in the Hartford Company are inspected also by them. It was not denied such a law might be excellent for such parts of the State as are not already fully protected, but this section should be exempted, thus obviating the necessity of drawing fires, shutting down, &c., so often.

Committees were appointed to communicate with manufacturing concerns in the two counties and to decide as to admissions to membership.

The meeting adjourned to meet again in the same place March 20.

Modern American Pistols and Revolvers.*

THE NEW REVISED EDITION of this work gives an account of the development of Pistols and Revolvers in America; a description of the varieties manufactured; the manner of shooting them; the work accomplished with these arms; departments of Pistol and Revolver shooting; impressions formed by studying these arms; and rules governing Pistol and Revolver competitions. The book is liberally illustrated, showing the dif-

ferent kinds of Pistols and Revolvers manufactured in America, and giving pictures of amateur Pistol and Revolver shots, as well as of inventors and manufacturers of these goods.

Courtesy at the Telephone.

H. M. BARRON of J. S. Barron & Co., dealers in wooden ware, 141-143 Chambers street, narrates an experience he recently had with a prominent house in this city. The head of the concern alluded to remarked that during November and December last he kept a record of all the clerks in their employ who answered telephone calls. Those who were civil and in other ways gave the impression to inquirers that it was a pleasure to hear from them and courteously answer their queries were marked "No. 1." Those who were impertinent, abrupt with answers and haven't-the-time sort were classed "No. 2." At the beginning of the new year those marked No. 1 were kept and advanced somewhat. Those in the No. 2 category were either reduced in salary or their services dispensed with entirely. Without discussing the ill breeding of giving indifferent answers, the reasoning of the senior partner quoted was that inasmuch as so much business is now done by telephone the answer one receives either makes a good impression or does much harm.

Bicycle Notes.

THE WALTHAM MFG. COMPANY, Waltham, Mass., are offering a line of Orient wheels, including the Orient Rapid Transit, weighing 21 pounds, listing \$150; Model A, the same as the Rapid Transit, with single tube road tires and steel rims, weighing 25 pounds, listing \$135; the ladies' Orient, weighing 22 pounds, listing \$150; or with steel rims and single road tires, weighing 26 pounds, listing \$135. Special track machines, weighing from 20 to 17 pounds, will be built to order, using 22-gauge tubing and featherweight tires. The special features of the machines is their high grade Mannesmann tubing, method of reinforcing the frames, narrow tread, rat trap pedals, and the universal handle bar.

THE PHILLIPS WHEEL COMPANY, Rochester, N. Y., issue a pamphlet describing the Phillips Cycles. The motor consists of two radius beams, attached, one on either side, to the rear of the frame. From the forward ends of the beams arms extend downward, to which the pedals are attached. At the angle formed by the radius beams and the pedal arms driving rods are attached, which connect with the cranks. The point is made that the dead centers present in the machine of the rotary type are done away with, and that effective power is constantly being applied throughout the entire revolution of the crank. The line of wheels include Pattern C, gear 84, weight 30 pounds, listing \$160; Pattern D, gear 80, weight 32 pounds, listing \$150, and a racing wheel, geared from 88½ to 100, weight 22 pounds, listing \$180.

Trade Items.

THE H. W. HILL COMPANY, Decatur, Ill., have sold all their machinery for the manufacture of Hog Rings, all patterns for Hog Ringers and Hog Holders, as well as their trade-marks, to the Decker Mfg. Company of Keokuk, Iowa. The latter are therefore soliciting the orders of the trade for the genuine "Old Original Hill" Hog Rings and Ringers.

PIKE MFG. COMPANY, Pike Station, N. H., call attention to the fact that Washita and Arkansas Stone of inferior quality is being offered to the trade and suggest that buyers of this line of goods should be careful to obtain only standard qualities. They state further that they own or control all the good Washita and Arkansas quarries, E. Bertram Pike being at Hot Springs giving personal attention to the quarrying of the Stone. The company's policy has been to protect their customers with as low or lower prices than they can get elsewhere, and they guarantee all their goods and prices.

N. R. STREETER & Co., Groton, N. Y., for whom William H. Jacobus, 90 Chambers street, New York, is agent, issue a circular calling attention to the various lines of Sad Irons, Mincing Knives and other Hardware specialties which they are manufacturing. A stock of these goods is carried by Mr. Jacobus at the above address.

CHAS. BUCK, Millbury Edge Tool Works, Millbury, Mass., issues a circular in which a short history is given of his experience as a manufacturer of Edge Tools. Mr. Buck has been identified with the manufacture of these goods in this country since 1853, a period of 40 years. The circular also gives a portrait of Mr. Buck, and announces the Woodrough & Hanchett Company, 38 and 40 Lake street, Chicago, as general agents for the Northwest.

J. L. SIMPSON, formerly of the Seattle Hardware Company, Seattle, Wash., has severed his connection with that firm and returned to Detroit, where he will probably engage in business.

W. K. HAWKS, general manager of sales for the Philadelphia Lawn Mower Company, successors to Graham, Passmore & Co., Philadelphia, refers to orders taken south and west of Boston as comparing favorably with those taken up to the same time last year. While the Style M, S and D Mowers are well known, we are advised that buyers show their willingness to order the Style A Steel Mower and Style B self-adjusting Mower, confident that they will give satisfaction.

G. G. MAKEPEACE has purchased the interest of his partner, W. S. Colwell, in the Hardware firm of Makepeace & Colwell, Indian Orchard, Mass., and will continue the business as heretofore, paying all bills and collecting all accounts due the firm.

WE ARE INDEBTED to Chas. Matthews of Columbia, Mo., for a souvenir showing public and private buildings of the city, conveying some idea of the character of its institutions and its position as a business point. Prominent among the pictures is an exterior view and two interior views of Mr. Matthews' Hardware establishment.

THE COPARTNERSHIP heretofore existing under the name of Birnbach Bros. & Winkler, 21 Blackstone street and 73 North street, Boston, has been dissolved by mutual consent. The business will be continued by the Blackstone Tinware Mfg. Company.

THE BUILDING, 72 and 74 Pearl street, Boston, was badly damaged by fire February 27. The fourth and sixth.

* By A. C. Gould (Ralph Greenwood). Royal 8vo, 222 pages. Price \$1.50. For sale by David Williams, 96-102 Reade street, New York.

floors of the building were occupied by the Bigelow & Dowse Company for the storage of Hardware. Everything on the sixth floor was destroyed and the stock on the fourth was heavily damaged, involving a probable loss of \$10,000. The insurance will foot up \$7500.

R. D. BOICE, Geneseo, Ill., has sold his Hardware business at that place to a new firm, who will continue it under the style of Carter & Weidlein. The principals of this firm, J. C. Carter and W. E. Weidlein, are young men and are referred to as enterprising and of excellent character. Mr. Boice is now 64 years old, and has conducted the store for 35 years. He has, however, had over 50 years' experience in the Hardware business, having formerly been identified with it at Pittsburgh, Ashland, Ohio, and Rochester, Minn. Mr. Boice is officially connected with two banks, and will hereafter devote his attention to land and loan matters.

STEWART, SHULTS & BERGEN, Hardware merchants, of Fort Plain, N. Y., have purchased the building occupied by them from the owner, E. W. Wood. The consideration was \$7500.

AT THEIR MEETING, at Rochester, N. Y., on the 27th ult., the New York State Association of Retail Implement Dealers chose the following officers for the ensuing term: H. H. Brown, Spencerport, president; W. M. Wilson, York, vice-president; H. E. Wheeler, East Bloomfield, secretary and treasurer; M. J. Wilson, Rushville; O. L. Dorman, Sherman; E. P. Deischler, Lyons; M. P. Allen, Lima; C. M. Kelly, Newark, and E. S. Wilder, Batavia, directors.

COLBY WRINGER COMPANY, Montpelier, Vt., have made arrangements with Surplus, Dunn & Alder, 97 Chambers street, New York, by which the latter will represent them directly to the trade throughout the country.

OUR READERS will observe the Special Notices which appear in this issue signed "President." In one of these it will be observed that an opportunity is presented to some manufacturer to make use of a portion of the plant with which the advertiser is connected with a consolidation of interests. The other Special Notice relates to an opening for good salesmen in the Fancy and Upholstery Hardware line. The company with which the advertiser is identified is well known in the trade and was established many years ago.

JOHN S. BOLTON, Moline, Ill., is now manufacturing Ryan's Patent Post Hole Digger. Mr. Bolton is the successor of the former manufacturers, C. Peterson & Co.

W. P. TOWNSEND has retired from the firm of W. P. Townsend & Co., New Brighton, Pa. Mr. Townsend's sons, Charles C. and Edward P. Townsend will continue the manufacture of Wire, Rivets and Wire Nails under the firm name of C. C. & E. P. Townsend. This business was established in 1816 under the style of R. Townsend & Co., who were succeeded in 1864 by W. P. Townsend & Co.

WEED, RILEY & Co., Cohoes, N. Y., in sending out a recent edition of their catalogue, direct attention to the fact that a stock of their D. Simmons & Co. brand of Axes and Edge Tools is carried at their warehouse, 11 Gold street, New York. This brand is familiar to the trade, having been sold in this country and exported for 50 years. They add that if the goods cannot be obtained through near by jobbers they will be pleased to receive a direct order. Their catalogue contains varied assortments of Axes, Adzes, Hatchets, Mattocks, Picks,

Grub Hoes, Hammers, Sledges, Mauls, Bush Hooks, Rivet Sets, Turpentine Tools, &c.

CHARLES W. PACKER, Philadelphia, is manufacturing the Good Luck Ice Cream Freezer, in addition to his line of Standard Freezers, reference to which was made in our issue of March 1, 1894. The Good Luck is designed to supply the demand for a freezer with covered gearing that could be placed upon the market at a lower price than the Standard. The materials used in the Good Luck are of the same quality, we are advised, as those of the Standard.

THE AMERICAN WRINGER COMPANY, in the special notice on another page, offer for rent from May 1 the second loft of 99 Chambers street. The loft is 25 x 100 feet in dimensions, and is referred to as a very desirable one.

LOUIS HARLOW of the firm of Libby, Harlow & Co., wholesale dealers in Cutlery and Fancy Hardware, at 69 Pearl street, Boston, who was stricken with typhoid fever while on a Western trip some seven weeks ago, is convalescent in Chicago.

PEERLESS RUBBER MFG. COMPANY, manufacturers of several forms of Packing, Hose, Diaphragms, Air Brake and Steam Hose, &c., will soon remove from 15 Warren street to No. 16, just opposite. They have secured the street floor and two basements, each measuring 100 x 25 feet. This will enlarge their facilities and enable them to more expeditiously transact business, in roomy and well lighted quarters.

HATCH CUTLERY COMPANY, 97 Chambers street, New York, have greatly enlarged their facilities for transacting business, by leasing a part of the same floor formerly occupied by them. The new section faces Chambers street, and measures 25 x 100 feet. They will now carry a full stock of the Shears, Scissors, Razors, Knives, &c., made by them at South Milwaukee, Wis., and Middletown, Conn. Shipments in many cases will hereafter be made from New York. They now have samples displayed in two handsome upright oak showcases with glass fronts. This branch, as formerly, will be in charge of David Eastman.

R. K. CARTER, 13 Murray street, New York, resident buyer for a large number of Hardware houses in various parts of the United States, has recently established a branch in Pittsburgh, Pa., in the Times Building, room 701. Purchases of heavy goods usually bought West will be made from this office, with the advantage of having a buyer in that territory. Headquarters will be maintained in New York as usual with the regular office staff. The Pittsburgh department will be in charge of Mr. Greening, formerly with Stollberg & Clapp, Toledo, Ohio.

J. F. MCCOY COMPANY, 26 Warren street, New York, have leased a portion of their space to J. W. Voorhis & Co., who were until recently at 23 Warren street occupying the store vacated by Butler Hardware Company last fall. Mr. Voorhis, who was formerly connected with the latter company, will deal in Builders' Hardware, Hand Elevators and Dumb Waiters, Hoisting Appliances, Contractors', Railroad and Mill Supplies.

A. G. SPALDING & BROS., dealers in Athletic Goods, on May 1, will remove from Broadway and Murray street to 126-130 Nassau street, occupying as well 15 and 17 Beekman street, recently leased by them. This will give them a central and desirable location, well known to the wholesale and retail trade as the headquarters of

Peck & Snyder for 30 years, whose business the Spaldings absorbed two years ago. The increased facilities will enable them to concentrate both wholesale and retail trade under one roof, besides giving them the advantage of a well-known center for this class of goods. For the present the premises 492 and 494 Broome street will be retained for manufacturing and storehouse purposes.

Penny as Applied to Nails.

REFERRING to the explanation that the word "penny" is a corruption of "pound," so that a 4d Nail was originally one of such a size that 1000 of them weighed 4 pounds, a correspondent of the *Iron-monger*, London, says that this explanation is new to him, and instead of it, gives one entirely different. He states that his grandfather, father and himself have been makers and sellers of Nails for at least 100 years, and they have always understood that by 6d Nails was meant the size of Nails that could be sold at 6 pence per 100, and in confirmation of this theory states that up to this day they keep 2d, 3d, 4d, 6d, 8d, 10d, 20d, 24d Nails, which they retail in small lots at these prices per 100 Nails counted out.

Packing Goods for Export.

IN A RECENT ISSUE of Consular Reports, Volume XLIV, No. 160, by the Bureau of Statistics, Department of State, Washington, D. C., much valuable matter relative to packing goods for export which is given has been gathered by United States consuls all over the globe. It is a volume of 280 pages, gotten up especially for merchants doing a foreign trade. It is exceedingly valuable as a book of reference, and may be had gratuitously by applying for it, as above.

Last July the Department addressed to all consular officers a circular directing them to prepare reports concerning the proper packing of American goods for shipment abroad, from the standpoint of the foreign buyer or importer, dealing with Iron manufactures, Hardware, dry goods, groceries, &c. Without reviewing the work at length an excellent idea of its value will be gained by stating that information was sought on the following leading points:

1. How do goods reach your district from the United States, and what are the handlings and usage to which they are subjected *en route*?
2. How goods are landed, at wharves or aboard lighters.
3. Are warehouses provided, or are goods liable to be exposed to the elements?
4. How goods are shipped to interior points. If by pack horses or porters give the size—length, breadth and height—and suitable weight of packages.
5. Best material for outside covering. Should the package be a bale, box, keg, barrel, sack or bag? Should the package be water proof?
6. Are customs duties charged on the box, keg, &c., and to what extent does such imposition of duties affect the cost of goods to the importers.

This correspondence has resulted in the compilation of a large amount of valuable information in concise form, so arranged, classified and indexed both under topical and geographical headings that the most inexpert should be able to find what is wanted quickly.

The best general rule to observe in packing is to follow implicitly the directions of purchasers, charging a fair price if put to much extra expense or trouble. Often directions seem ridiculous, but experienced foreign and domestic buyers know best what they want and usually have excellent reasons for the directions given. Goods arriving out unsalable or badly damaged from improper packing drive would-be purchasers elsewhere. Our rivals abroad mastered this subject long ago, and the sooner we give it more attention the quicker will trade be increased.

There are also incorporated many valuable suggestions relative to the proper classification of goods and preparation of proper invoices; opportunities of reducing expense by observing the provisions of various tariff schedules, &c. Also as to use of wire nails, packing papers, zinc lined cases, patent clasps, and numerous new appliances. To build up a remunerative trade the customs of the different countries must be conformed to, a feature Europeans take great pains to accomplish.

The Co-Insurance Clause.

WE ARE IN RECEIPT of a communication from George D.

Markham, a leading insurance agent of St. Louis, in reply to the letter from A. W. Parmelee of Worcester, Mass, which was published in *The Iron Age*, February 8. From Mr. Markham's letter we take pleasure in making the following extracts, which will be of interest as relating to the settlement of losses. Referring to the instance which Mr. Parmelee cited, Mr. Markham says:

Probably most of the policies in question read according to the New York standard policy in which the second and sixth lines read as follows: "And shall not in any event exceed what it would then cost the insured to repair or replace the same with material of like kind and quality . . . but there can be no abandonment to this company of the property described." This clearly limits the damage in question according to certain principles and leaves nothing in doubt except what should be the proper payment under these ascertained principles. With the lines of the settlement thus clearly laid down by the contract itself, any disagreement as to the actual amounts due the assured under these principles is provided for in lines 86 to 90 of the policies, according to which the assured and the company each select appraisers and the two appraisers select an umpire, and the award of this board of arbitration is final. Mr. Parmelee's account of his experience with the adjusters is inexplicable with this clear method of settlement provided for in the contract. Perhaps, however, he made the mistake of guessing at his loss in the beginning and then resented any attempts on the part of the adjuster to

establish what the loss really was. Here is the most frequent cause of trouble in a fire loss adjustment, but every sensible business man must know that the companies are compelled to have their proofs of loss made up in satisfactory and convincing form, for which accurate inventories and awards of competent appraisers are indispensable. And as the fire loss is the element which establishes rates of premium all premium payers are interested in seeing that every precaution is taken against mistake, carelessness, honest overestimate or fraud. If, however, Mr. Parmelee felt that the agents were not treating him honestly under the contract, he should have stopped all communication with them, prepared his proofs of loss according to the instructions given in lines 67 to 79 and presented the proofs to the companies and promptly instituted suit. Every business man who has had much to do with insurance companies or who has served as a director in any insurance company knows well that a company will never permit suit to be filed unless they have in their judgment a sufficiently clear case to convince the most prejudiced jury. No other jury is ever drawn by an insurance company and the full knowledge of this fact will deter any company from going to suit unless absolutely driven to it. They never stand suit on minor points or immaterial differences.

If Mr. Parmelee had settled the amount of damage on the property with the adjuster there could have then been no question about the money due from the insurance company under the 80 per cent. co-insurance clause. On his own statement of the case the loss would have been divided as follows:

Value on plant.	\$45,000
Least amount of insurance to be carried as agreed by the 80 per cent. co-insurance clause.	36,000
Insurance actually carried.	30,000

making a shortage of insurance under the co-insurance clause of \$6000 and making the companies pay thirty thirty-sixths or five-sixths of any loss. Now, if he had agreed with the companies on the gross amount of damage to the property, he would have collected five-sixths of that damage even if it exhausted the policies. For instance, if he and the adjuster had settled that the loss was \$30,000 he would have collected five-sixths of that amount, or \$25,000. This would have been his right under the policies; no man could have deprived him of it.

He says that "no man can tell what is 80 per cent. of his value," and consequently know what amount he should carry to comply with the 80 per cent. clause. This statement indicates that he does not understand values for insurance as compared with values for sale or investment. If there has been no change in the price of materials or labor for house building, the value of a building is its own cost less a reasonable depreciation for wear and tear; and the value of a machine, if the price of a new machine has not changed, is that price less a suitable depreciation for wear and tear. It makes no difference what the assured paid or what the property could be sold for in the market, for manifestly the things might have been presented to him (which would not prove that they had no value), or he might have paid an extravagant price for them, which would not indicate that they were worth his purchase figure. If an assured does not know what the value of his property is under above principles, who does know? It would be folly to send an appraiser to every risk which is insured, instead of verifying the assured's figure in the event of an occasional fire.

Wallace & Sons.

IT GIVES US PLEASURE to announce to the many friends of Wallace & Sons, the proprietors of the Brass and Copper Rolling Mills at Ansonia, Conn., with warehouses at 29 Chambers and 5 Reade streets, New York, who last summer, owing to the stringency of the money market, were obliged to go into the hands of receivers, have made a settlement of their affairs with their creditors, and the receivership has been vacated. The business of Wallace & Sons has never been discontinued, the receivers having run all the mills during the time they were in charge.

New York Belting & Packing Company.

THE NEW YORK BELTING & PACKING COMPANY, with New York office and store at 15 Park row, New York, manufacture a large line of goods in which the Hardware trade are interested. They own three separate factories, two of which are located at Newtown, Conn., and one at Passaic, N. J., designated as factories Nos. 1, 2 and 3. Factory No. 1, at Newtown, has excellent shipping facilities and an exceptionally fine water power. The main building of the plant is a substantial brick structure five stories in height, 300 x 60 feet in size. At right angles to this is a four-story addition, 77 x 30 feet in size, close to which are separate buildings for engine house, boiler house, machine shop, carpenter shop, gasometer, storehouses, &c. In sight of the factory the company own a handsome house, which is occupied by the superintendent, and 40 neat cottages for the use of the workmen. In the factory, large turbines run the machines for washing, mixing and calendaring rubber, many of which machines are new and have labor saving attachments. There are also heavy hydraulic presses for Belting, Packing and Matting. An interesting part of the plant is the new Hose room, a light, airy, spacious apartment, where everything from start to finish is done by machinery. A very few men are here able to turn out 25,000 feet of Hose a day, producing an article which the company consider superior to hand made Hose. L. K. McClymonds, general manager of the company, referring to this department, says that the Belting cured under pressure is superior to the article made before they had Belt presses, as making Hose under pressure improves its quality. Arrangements have been made to avoid the unnecessary handling of goods. The raw material entering at one end of the mill is delivered at the other end in the shape of finished product. The factory employs about 600 operatives and 600 horsepower—water and steam.

Factory No. 2, also located at Newtown, is not as large as No. 1, and is used chiefly as a help mate for it. Much of the raw material is here prepared, and the factory has recently been fitted with new grinders conveyers, centrifugal machines, vulcanizers, &c., and is capable of turning out a large quantity of stock with little handling and few operatives. The two brick buildings—one of five stories, 74 x 50 feet, and the other two stories, 124 x 40 feet, are situated close to the river that turns the wheels of factory No. 1, and have both water and steam to rely upon for motive power.

Factory No. 3, the best equipped plant of all, is located at Passaic, N. J. The buildings are of brick, the larger being 390 x 60 feet, and the other 250 x 60 feet in size. Here is made the finer class of goods in mold work and specialties. At the further end of the building, nearly 400 feet from the office, is the compounding room, where the rubber and ingredients added to it are weighed. Nearer are the mixers, still nearer the calenders, close at hand the presses, followed by the tables for the finishers and the shipping room. Interspersed among the machines are varied mechanisms for the saving of labor, among which is a pneumatic device for slipping Jar Rings from a mandrel and forcing another tube on at the same time; a cage that is full of cords of rubber in which a knife revolves, cutting them into convenient bits for mold filling; also many other devices, new, automatic and effective. The floors above are devoted to the making up of various goods and the storing of supplies, while the topmost floor is used as a large dry room, where thousands of dollars' worth of Para rubber is hung, going through the process of air drying.

The second main building, just completed, is most substantially constructed. A part of the lower floor is used for a shipping room and another portion for a mixing and calendaring room. The floor above is devoted to the manufacture of Pneumatic Tires and is the most complete and conveniently arranged of the departments. The floor above this is a *fac-simile* of the Hose room at factory No. 1 and, like it, has a capacity of 25,000 feet of Hose a day. An interesting department of this factory is the Emery Wheel section. Here is a complete plant, consisting of mixing mills, calenders, presses, molds, vulcanizers, lathes, diamond pointed tools and other devices for use in the manufacture of Vulcanite Emery Wheels. All kinds of Wheels are made, ranging in size from a cheese box down to a lozenge, and using emery grains as coarse as rice or almost as fine as powder. The factory is run by water power, although fitted with engines in case of scarcity of water. The aggregate is placed at about 1800 horse-power. Electric lights are in use throughout the plant, and a new system of piping is being put in place. In addition to this a new system of shafting and gearing is being installed. In this factory, as in No. 1, the unnecessary handling of goods during manufacture is carefully avoided. Manager McClymonds remarks that the policy of the company is to make improvements in their factories when opportunity presents, employing new processes and new machinery where better results can be obtained, and to avoid the lowering of grades, economy in the use of rubber and the misuse of adulterants.

Geo. W. Peck Company.

THE GEO. W. PECK COMPANY have been organized for the purpose of continuing the Hardware business formerly carried on by Geo. W. Peck & Co., at Prattsburg, Pulteney, Cohocton, Bath and Bradford, all located in Steuben County, N. Y. The capital stock of the company is \$75,000, of which \$60,000 has been paid in. Mr. Peck started in business in Savona in 1876 and was in business there for five years, at the end of which time he sold out to Hall & Gaylord. In 1881 he bought out George Look of Prattsburg. Two years later he opened a store in Pulteney, and in 1886 bought the Harris stock of Hardware in Cohocton. In 1888 he bought out Hodgman & McNamara of Bath, and in April last started a store at Bradford. Mr. Peck advises us that the total sales

of his different stores during 1893 were over \$150,000, and that this business has been built up from the store opened at Savona without, practically, any outside capital being put in. The partners of Mr. Peck in the various stores were first identified with them as clerks, eventually being taken in as partners, and with one exception all the money now invested in the business by these persons has been made and saved out of it. We are advised that the reason for merging the business into a stock company is that the parties identified with it believe that it will be beneficial in connection with the buying, looking after collections, &c. The corporation will assume all the liabilities of the several stores.

Price-Lists, Circulars, &c.

THE EMPIRE KNIFE COMPANY, West Winsted, Conn.: Empire Corkscrews. An illustrated catalogue devoted to these goods shows with prices a large and varied line of Corkscrews. Referring to these goods the manufacturers state that they are wrought from the steel rod under the hammer with special dies, and finished with the latest and most improved machinery. Attention is also called to Empire Pocket Knives, which are made from Wardlaw's steel.

OSSAWAN MILLS COMPANY, Norwich, Conn.: Picture Cords, Picture Wire, Shade Cords, Sash Cords, Chalk Lines, Air Brake and Signal Cords, Clothes Lines, Picture Hooks, Chain, Nails, Picture and Shade Hardware. The company's first complete illustrated catalogue, under date of 1894, is a well arranged and handsomely printed book of 56 pages, fully illustrated, containing list prices of their entire line as shown. The manufacturers remark that it has always been their aim to make the best goods in their line; and that with their patented machinery they are able to manufacture a great variety of twisted, braided and woven goods, which they cannot illustrate, as they are for special orders. They further state that they do their own dyeing, and can give perfect satisfaction on all work requiring any kind of colored yarns, which they can match to a shade.

HILTS' WRENCH & PAPER CUTTER COMPANY, Richford, N. Y.: Hardware specialties. Circulars illustrate Folding Tub Bench and Wringer Holder, Hilt's adjustable Chain Pipe Wrench, Lightning Mincing Knife, reversible Eclipse and Ideal Paper Cutters.

JOHN STORTZ & SON, Philadelphia, Pa.: Brace and Machine Bits, Gimlets, Spoke Shaves, &c. An illustrated price-list shows the following bits: Double cut Gimlet, Nose, Shell, Spoon, Brush, Chair, Center, Taper Screw Driver, Counter Sink and Square Reamer; also Wood Spoke Shaves, bell hangers' and electricians' Hand Gimlets, bell hangers' and electricians' Brace Bits and Hand Gimlets. This business was established in 1853, and the manufacturers refer to the quality of the goods.

WAGNER MFG. COMPANY, Sidney, Ohio: Wagner high grade, extra finished and nickel plated Hollow Ware, Sugar Kettles, Ventilator Grates, Cast Mails, &c. An attractively printed catalogue of 60 pages illustrates a large line of these goods, with prices. Attention is called to many new goods added to their line and the high quality of their ware.

THE SOUTHWARK SCALE COMPANY, Philadelphia, Pa.: I X L Counter Scales. Leaflets issued by the company give prices and descriptions of these goods, with illustrations of the Scales in colors.

PULLMAN SASH BALANCE COMPANY, Rochester, N. Y.: Pullman Steel Frame Sash Balances, Wrought Steel Spring Hinges and Standard Hardware Specialties. The company's eighth annual catalogue illustrates, with prices, Side and Top Balances, Car Window Balances, Show and Wall Case Balances, Spring Hinges, Meat Tenderer, Malleable Garden Trowel, Giant Side Sash Lock, Aluminum Bronze Sash Ribbon and Eureka Attachments. Illustrations are also given of Ward & Doron's Distance Reading Thermometers, for which the company are exclusive selling agents for the United States and Canada.

THE HENRY C. AYER & GLEASON COMPANY, Philadelphia: Gleason's Instantaneous Positive Bench Vise. The Vise is described in an illustrated circular as being especially adapted to the requirements of pattern makers, carpenters, cabinet makers and all wood workers; extremely simple, instantaneous in action and capable of taking work instantly from zero to 8 inches and holding it parallel without adjustment.

It Is Reported—

THAT W. J. Knowles and W. G. Nott have dissolved their partnership in the Hardware business at Brantford, Ont., Mr. Knowles retiring to devote his entire time to the management of the Goold Bicycle Company and the Knowles, Ham & Nott Company. He has been succeeded by Walter R. Turnbull, the name of the new firm being Nott & Turnbull. Mr. Turnbull has been connected with J. Y. Morton & Co. for the past six years. Mr. Nott has been identified with the business for over seven years. Improvements are contemplated in the present premises. Among other things they will have a plate glass front. The establishment will also be materially enlarged.

That McClellan & Sons Hardware store, at Troy, Kan., was badly damaged by fire on the 16th ult.

That the Hardware store of Keefer Bros., Olathe, Kan., was broken into by burglars on the 14th ult., and seven double barrel Shot Guns and one Repeating Rifle, worth over \$200, were stolen. Entrance was effected by cutting through a large plate glass window in front.

That the Jones Hardware Company have been organized at Richmond, Ind. The capital stock of the company is \$25,000. The directors are Sharon E. Jones, Clement W. Carr and James W. Carr.

That the Hardware store of Albrecht Bros., Wahpeton, N. D., suffered damage by fire to the extent of \$5000 on the 15th ult.

That the Hardware store of O. A. Martin, Fox Station, Ind., was burglarized of \$25 worth of Revolvers on the 11th ult.

That Millsbaugh & Drake's Hardware store, at Corning, N. Y., was damaged by fire and water on the 14th ult. The loss is fully covered by insurance.

That Peterson & Boyson, Hardware dealers, Lyle, Minn., have dissolved partnership. H. N. Peterson will continue the business alone.

That John F. Peck of Gardner, Ill., will open a new Hardware store at Virginia, Ill.

That on the 15th ult. burglars raided the Hardware store of L. B. Shapland, Guthrie, O. T., and got away with a

large quantity of Guns, Ammunition and Revolvers.

That the Cray Hardware & Stove Company, as successors to Cray & Parsons, have been organized at Delevan, Wis. The incorporators are Henry G. Hollister, E. M. Cray, H. C. Hollister and Charles L. Cray. The officers are H. G. Hollister, president; E. M. Cray, secretary, and Chas. L. Cray, manager.

That F. L. Thompson and J. M. Lewis have purchased the Hardware stock of the late J. T. Cadby, Muscoda, Wis., and have formed a partnership to carry on the business.

That the style of the Hardware firm of G. W. Anderson & Co., Griswold, Iowa, has been changed, and the firm will hereafter be known as J. L. Anderson & Son.

That E. A. Stephenson, Lowell, Iowa, is erecting an addition to his Hardware store, and will place in it a line of Farm Implements and Farm Machinery.

That the Hardware business at Omro, Wis., formerly the property of Fred. Bunker, but recently in the possession of S. J. Seabury, has again changed hands, the purchasers being Imig & McNulty of Waukesha, who will hereafter conduct the store.

That A. L. Richardson of Van Wert, Iowa, has purchased a Hardware store at Promise City.

That E. M. Allen, Hardware merchant, Hastings, Neb., has disposed of his stock of goods to William Ohlheiser.

That the Hardware firm of H. W. Crane & Co., Mt. Pleasant, Iowa, have sold out to a new firm under the style of T. A. Niece & Co.

That by a fire on the 21st ult., Richards Bros., Hardware dealers, East Tawas, Mich., lost \$12,000.

That the Palmer Hardware Company, Rockford, Ill., have greatly enlarged their establishment, having leased the store adjoining it.

That the Hardware store of Justus, Rogers & Co., Bluffton, Ind., was burglarized on the 17th ult.

That Chas. Brent, Smithshire, Ill., has sold his stock of Hardware to M. S. Yoho of Ellison.

That about March 1 A. N. Bucklin & Co., Grand Junction, Col., will remove their Hardware stock into larger quarters.

That H. R. Roberts, Westfield, Wis., recently sold out his Hardware store to Rosenbaum & Meinke.

That Knight & Decker have purchased the Hardware stock of Geo. W. Miller, Grand Haven, Mich.

That C. B. Waite and H. H. Van Brunt have formed a partnership in the Hardware business at Council Bluffs, Iowa. The style of the firm will be Van Brunt & Waite.

That Henry Desnoyers has purchased A. B. Northrup's interest in the Hardware business heretofore conducted by Northrup & Wadsworth, Clark, S. D.

That J. R. Todd of Middletown, N. Y., has completed arrangements to engage in the Hardware and plumbing business at Warren, Mass.

That Hufford & Brown's Hardware store, at Wytheville, Va., was robbed on the 18th ult.

That Makepeace & Colwell, dealers in Hardware and Stoves, Indian Orchard, Mass., have dissolved partner-

ship, and hereafter the business will be conducted by Mr. Makepeace.

That the Hardware store of Ayres & Parrish, Nevada, Mo., was robbed of \$35 worth of Revolvers, Pocket Knives, &c., on the 19th ult.

That John L. Hanson will add Hardware to his large stock of general merchandise at Otisco, Minn.

That Julson & Tollefson have recently purchased the Hardware stock of Baldwin & Quimby, Austin, Minn.

That W. N. Shephard has withdrawn from the Hardware firm of W. N. Shephard & Co., at Tower, Minn. Mr. Congdon will hereafter conduct the business alone.

That John Augustine and J. F. Swanson have opened a new Hardware store at Red Wing, Minn. The style of the firm is Augustine & Swanson. Mr. Augustine was for many years connected with the Hardware firm of H. S. Rich & Co., and Mr. Swanson has been with the furniture house of A. Swanson & Son for several years.

Paints and Colors.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

White Lead.—Stronger tone to the market for crude material has served to check the later pressure of White Lead for sale, and rumors have circulated to the effect that some sort of deal has been made with producers whom the combine have been contesting lately, whereby more even and higher prices are to be established for the spring season trade. Regarding the latter rumor confirmation was wanting, but that the market for raw material—Pig Lead—has improved considerably is a matter of record. Some brands of Dry White Lead may yet be secured at 4¢, but on popular New York City brands 4½¢ is now the popular quotation and 4¼¢ the bargain rate. Lead in Oil has steadied up somewhat also, there being few, if any, sellers of Dutch process stock at less than 5¼¢, while the leading carrodors quoted ½¢ above that for 10-ton lots. The better tone is due in part to enhanced cost of Pig Lead and Linseed Oil, but has been helped along somewhat by better demand for the pigment.

Red Lead.—The position of the market is practically the same as it was a week ago. Some of the uncertainties incidental to the contest between home competitors have been cleared sufficiently to enable consumers to purchase with a certain degree of confidence, but the tariff matter is still a drawback and business, therefore, hardly reaches average volume for this season of the year, despite the comparatively low prices ruling.

Litharge.—In some degree this article has enjoyed the slight improvement experienced in other lines of corrodors' goods, but that room for improvement exists was quite generally admitted, and thus far there has been no improvement in prices of either American or foreign brands. Business has been done at as low as 4¼¢ for large lots, but prices below 4¾¢ are strictly the exception at the present time.

Orange Mineral.—No decided change has taken place in the market for either foreign or domestic brands. Business has been merely routine in character and chiefly at old prices.

Zincs.—Deliveries of domestic Oxide on old contracts have been fairly

large. New business makes quite a good showing also. Between the two the market has gained something, as far as tone goes, but it is no difficult matter to make purchases at rates that ruled last week. Foreign Zincs, while showing no radical change, are still more or less uneven in price and meeting with merely commonplace sales.

Colors.—It is understood that the leading manufacturers of Paris Green have formed a strong organization and placed the sale of their product in the hands of a very prominent member of the trade, M. D. Eger. The firms identified with the compact are A. B. Ansbacher & Co., Sondheim, Alsberg & Co., Pfeiffer & Lavenburg, Adler Color & Chemical Works, New York Enamel Paint Company and Morris Herrmann & Co. The Wholesale Druggists' Association afford material aid and comfort by announcing that they approve of the rebate plan, which will be adopted the coming season. The new list prices will be named not later than April 30. It is said that this is not a trust. No new features have developed in any other branch of the market. General trade is improving, but rather slowly.

Oils and Turpentine.

Linseed Oil.—The market is at present in somewhat uncertain form. Crushers have been very indifferent sellers because of the high cost of raw material, and, having good supplies in stock or under engagement, large buyers have purchased sparingly. The position of the Seed market, along with the apparently friendly relations between most crushers, would indicate that the chances are very much against prices dropping in the immediate future, if demand during month reaches the average volume.

Cotton Seed Oils.—Business in crude product has been extremely slow, and the market has shown rather weak tone, with prices about 1¢ below the average of those that ruled at the date of our last report. Refined Oils have suffered to about the same extent, since the demand proved disappointing while other influences were of more or less adverse character. There is hardly any speculative interest at the moment, and little doing on speculative account.

Lard Oil.—Quotations for Prime Oil have been maintained, as far as quotations go, but actual Oil has been sold in several instances at 1¢ decline, and rumor has it that greater concessions were made on particularly desirable orders. Regarding the volume of business, reports generally agree that it could be larger without running ahead of the average for this season of the year.

Fish Oils.—About the only change in this line is a drop to 62½¢ in New Bedford for Crude Sperm Oil. Little or nothing has been done in Crude Whale or Crude Menhaden Oils, and prices for those goods are greatly nominal. In the pressed and bleached Oils nothing of interest has transpired, business still being of ordinary character and chiefly at former prices.

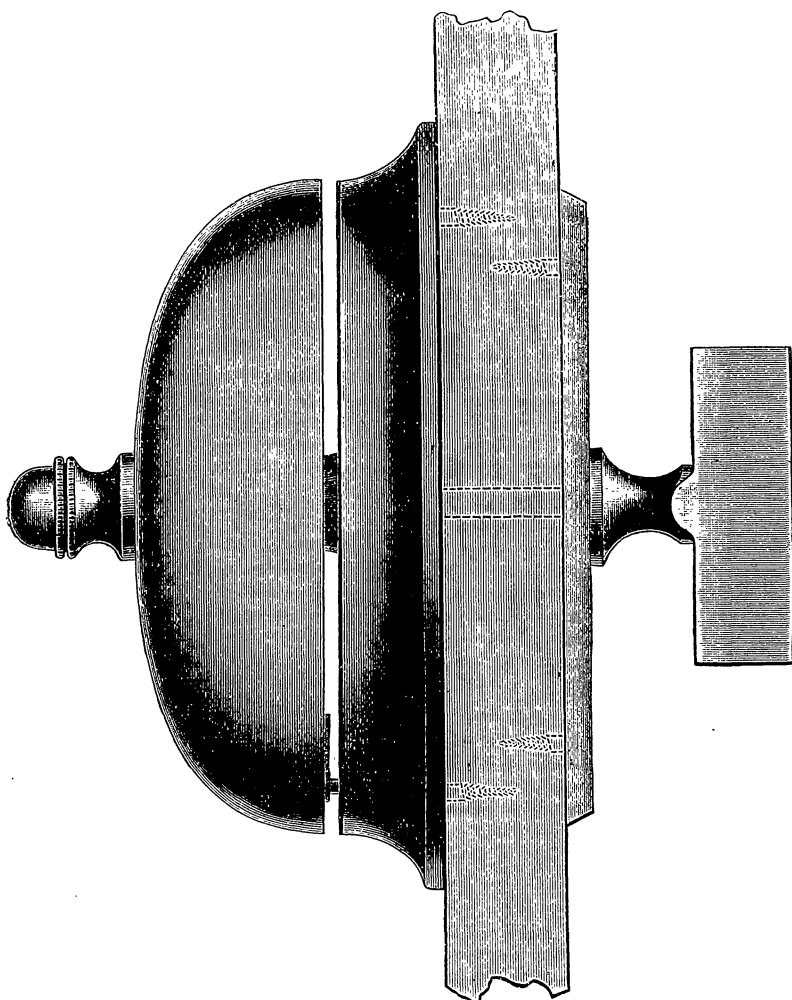
Miscellaneous.—Ceylon Coconut Oil has ruled somewhat lower under the weak market of greater pressure to sell for both prompt and forward delivery. Sales were made of spot goods at 5¾¢ @ 5½¢. Olive Oil has remained quite steady in price, although selling in a moderate way only. Red Oils are rather weaker in price and move off slowly.

Spirits Turpentine.—The movement in prices is not to exceed ½¢ per gallon, and the market is entirely bare of new or interesting feature. Business has been of strictly routine character. Last sales were at 31½¢ for regular and 32¢ for machine barrels.

Rotary Electric Ring Door Bell.

Sargent & Co., 33-37 Chambers street, New York, are marketing an electric ring door bell, as shown herewith in a full size cut. The bell has been devised to produce an electric bell effect without employing electric appliances. By turning the T-handle, which operates a simple brass gear mechanism, the gong responds instantly with an electric ring sound without the

Paris green away from the feed roll as it slowly passes through, and spreads it perfectly, it is stated, over the whole plant. A set screw is provided to regulate the feed from 1 to 1½ pounds to the acre. It is explained that no Paris green can pass the feed roll excepting when the crank is turned, enabling the operator to apply it to a few hills where the bugs are plenty and pass over where none is needed. The manufacturers claim that the machine is light and

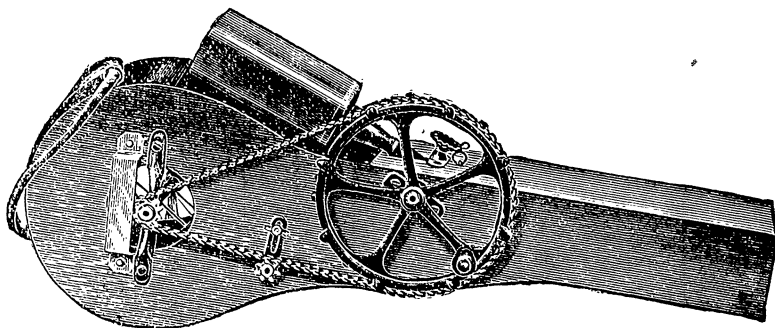
*Electric Ring Door Bell.*

use of springs. A feature of the bell is the arrangement of the hammer, which is mounted to slide on a pin with beveled bearings, revolved by the gear. In attaching the bell the hammer must be at the top, so that in turning the handle the hammer by centrifugal force is thrown rapidly against the gong, dropping away from it by gravity as soon as the motion ceases. The bells are packed one in a box and finished in nickel plate, Yeddo bronze and antique copper.

The Cyclone Insect Exterminating Machine.

The Hotchkiss & Tuttle Company, Wallingford, Conn., are offering the insect exterminating machine illustrated herewith. In operation it is carried with a cord around the neck and steadied by the left hand. A crank is turned slowly with the right hand, which by wheels and chain connections drives a fan or blower revolving 400 times a minute, thus creating a continuous current of air, carrying the

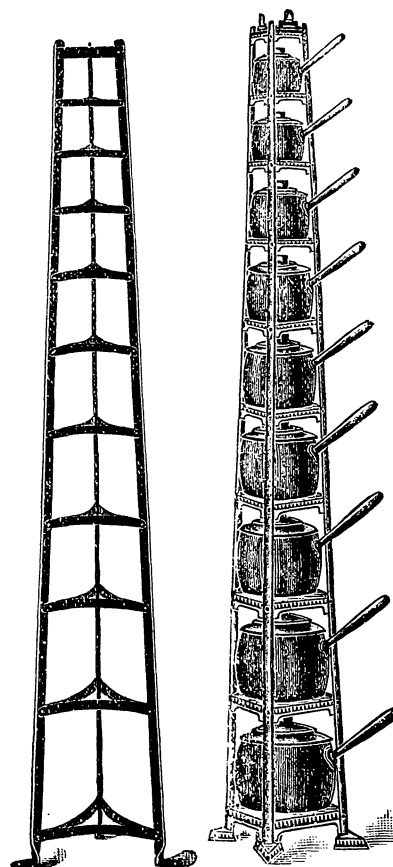
easily carried; that the current of air causes an even distribution of the powder; that the current of air being directly from the operator there is no reaction and inhalation of dust, and that

*The Cyclone Insect Exterminating Machine.*

poisons can be applied to plants at the rate of 1 pound or less to the acre, one row at a time, as fast as a man chooses to walk.

Saucepan Stands.

Silver & Co., 304-310 Hewes street, Brooklyn, and 20 Warren street, New York, are offering saucepan stands

*Wrought Iron.**Cast Iron.**Saucepan Stands.*

made of both wrought and cast iron, as illustrated herewith. They are referred to as strong, and handsomely japanned, and are designed for displaying saucepans as in Fig. 2; also deep and shallow pans and kettles. The point is made that the stands keep the utensils tidy and free from harm, and that an effective display is thus made of all sizes.

M. H. Kiebel, representing the C. T. Ham Mfg. Company of Rochester, N. Y., has removed from his temporary quarters in room 911, Masonic Temple,

Chicago, to room 611 in the same building. His line covers railroad and commercial Lamps and Lanterns, Motor Headlights, &c.

Columbia Tack and Nail Pullers.

The accompanying cuts represent a line of tack and nail pullers offered by the Hatch Cutlery Company, 97 Cham-

In operation it grasps the nail upon the same principle as other pullers, but there is no weight on the handle to force the jaws into the wood around the head of the nail. The puller is in-

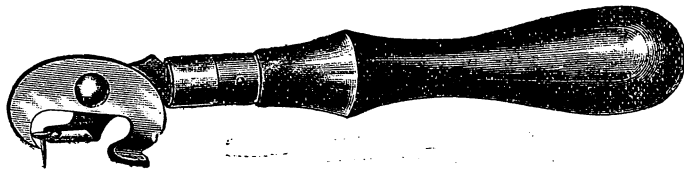


Fig. 1.—Columbia Tack Puller.

bers street, New York. The tack puller, as shown in Fig. 1, is of heavy stamped steel, with a black enamel wood handle, the tool measuring $7\frac{1}{2}$ inches over all. There is no spring connected with the jaws, but the foot at the back of the movable piece is sufficiently heavy to drop down, leaving an opening between the front and stationary parts, to put them astride a tack for pulling. The

tended only for light work, such as opening boot, shoe, drug, grocery and all light boxes of soft wood.

The Plymouth Interlocked Joint Wooden Rim.

The accompanying cut represents a wooden rim for bicycles being intro-

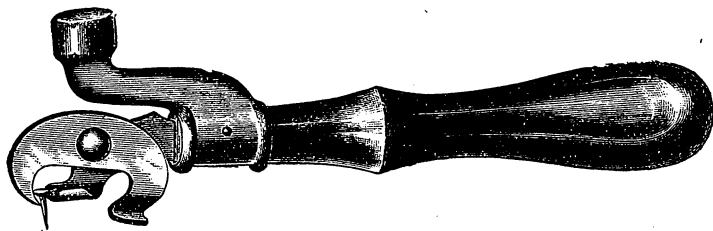


Fig. 2.—Columbia Tack Hammer and Puller Combined.

stationary jaw is gouge shaped, so as to go under the head of the tack and raise it when the handle is pressed down. The puller, of the hammer and puller combined, Fig. 2, is the same as the one described, but it has a tinned iron ham-

duced by the Indiana Novelty Mfg. Company, Plymouth, Ind. The rim is described as consisting of a single piece of hickory elm, bent, jointed and turned on a lathe. The rims will be made of white ash or hickory if preferred, but

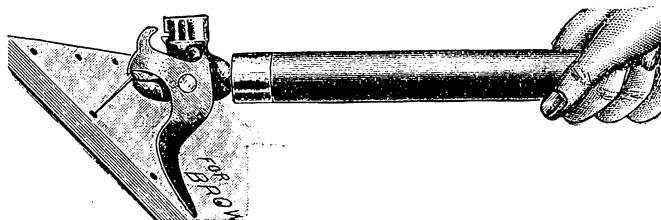
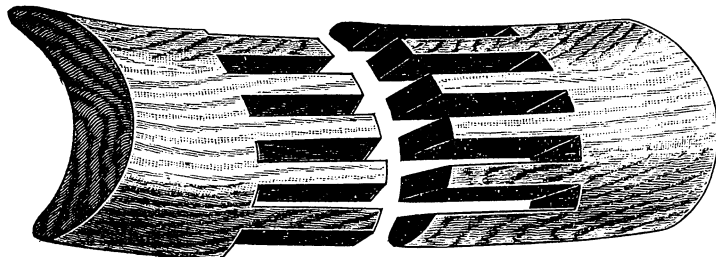


Fig. 3.—Columbia Nail Hammer and Puller.

mer attached, this being continuous with and forming the ferrule. The nail hammer and puller, shown in Fig. 3, is of solid drop forged steel, with a wooden handle. It is designed to set, drive and pull nails, and is described

the manufacturers recommend hickory elm as the best, as it does not split as easily as ash, and finishes with much less labor. The joint of the rim is so constructed that the ends come together square across. It contains a



The Plymouth Interlocked Joint Wooden Rim.

as having very strong tempered jaws. A plunger, operated by a spring on the opposite side of the device from the one shown in Fig. 3, holds the jaw closed against the hammer head to retain the nail when setting it, and also holds the jaws open to receive the nail for pulling.

series of tongues or grooves interlocking, the cut showing the joint before it is put together. It is claimed that the joint would stand without glue, as the tension of the spokes makes it tighter instead of straining it apart. The manufacturers state that the hickory

elm is a very hard close grained wood, which finishes beautifully either painted or in the natural color of the wood; and that the water proofing used will take either paint or varnish, and will also stand the cementing on of the tire. The rims will be made for any style or make of tire desired, if ordered in sufficient quantities.

The Cyclone Tire.

The S. A. Haines Company, Indianapolis, Ind., are introducing the Cyclone tire, as shown in the accompanying cuts.

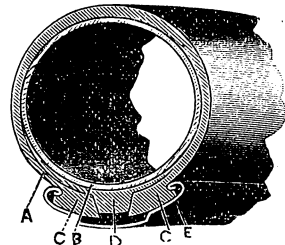


Fig. 1.—Cyclone Tire.

The tire and rim are shown in Fig. 1, with the inner tube in position and inflated. A represents the outer tube or cover, made, it is stated, of the finest material; B is the inner tube, which rests on a true and regular surface, to avoid any liability to cut or wear; C is the edge of the outer cover with beaded sides molded to fit the rim; D is a

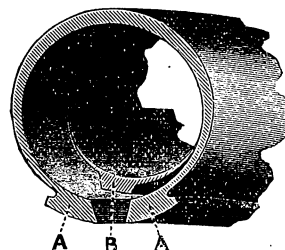


Fig. 2.—Tire without Inner Tube.

wedge or V-shaped piece with thin flanges extending on either side, one of which is a part of the outer cover, the other resting loosely on the inside between the outer and inner tubes. When the inner tube is inflated it presses the wedge D down into position between the beaded edges of the outer tube C

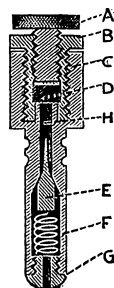


Fig. 3.—Cyclone Tire Valve.

and forces them well under the hooked edges of the rim, holding the tire, it is remarked, firmly in position. The steel rim E is described as being of the finest cold rolled steel of a suitable gauge, corrugated on the bottom and with hooked sides, with the edges turned under, making a light, stiff rim, which will not cut the tire.

In Fig. 2 the tire is shown without the inner tube, and with the wedge shaped piece B slipped up out of position, as it is when the inner tube is deflated and removed, thus admitting, it is claimed, of easily removing the tire from the rim by simply pushing the edges of the outer tube away from the hooked edges of the rim. In Fig. 3 A represents a thumb screw which enters into the plug B, the latter being screwed to the bottom of C, which is part of the outer tube of the valve. An extension at the bottom of C enters part way into B, this extension being the valve seat, on which rests a rubber disk, D, and on top of this is a small washer upon which A screws down for adjustment. The rubber disk D is incased in such a manner as to prevent spreading or hardening. H is the inlet to the check valve E, F is the spring to keep the valve in place and G is the plug to hold the spring in position. It is stated by the manufacturers that this makes a double valve, light, handsome, easily managed, and, they believe, impossible to leak. The arrangement of the tire, it is remarked, is simple; its material of the best and most durable quality; the tire light, resilient, readily detached from the rim and strongly held there when inflated.

The Silver Cooking Crock.

The accompanying illustrations represent a cooking crock, offered by Silver & Co., 304-310 Hewes street, Brooklyn, and 20 Warren street, New York. As shown in Fig. 1, the crock



Fig. 1.—Cooking Crock.

is of porcelain, with a heavy tin cover, which when placed on the crock and given a turn will be securely locked in position, so that the crock may be carried by the cover handle. The crock is placed inside any covered vessel, such as an iron or tin saucepan or tin bucket, the outside vessel being partially filled with water and the crock containing the food to be cooked. Fig.

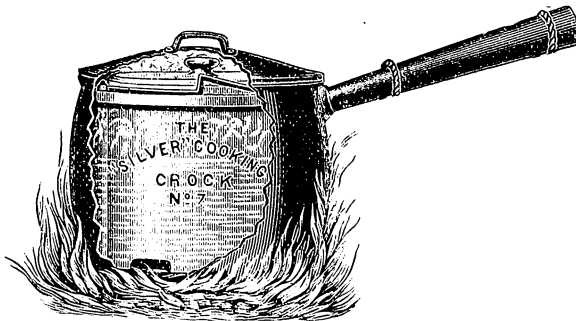


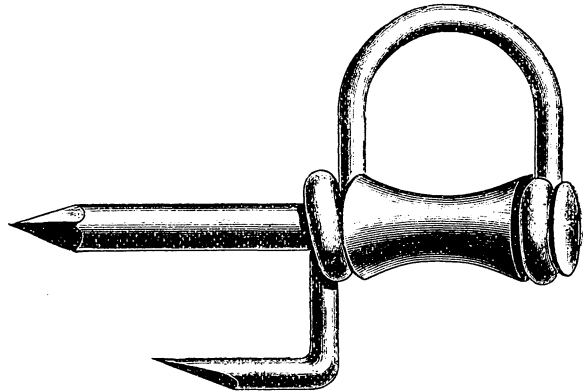
Fig. 2.—Cooking Crock in Use.

2 represents a vessel supplied by the company, or crocks may be purchased separately. The crock is designed for cooking cereal foods, milk, soups, vegetables, fruits, meats, &c. The

manufacturers claim that with the use of the crock stirring is unnecessary, burning impossible, and that the crock preserves the nutritious juices and delicate flavors, making the food appetizing and satisfying. The crocks are made in 1, 2, 3 and 4 quart sizes.

The I X L Wire Fence Roller Staple.

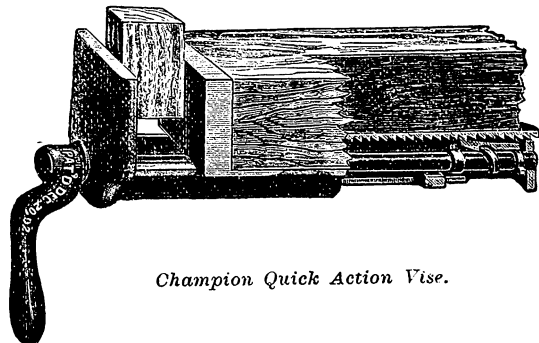
O. P. Schriver & Co., Cincinnati, Ohio, are putting the wire fence roller



The I X L Wire Fence Roller Staple.

staple on the market, as shown in the accompanying cut. The device is designed to take the place of all fence staples on all posts. The point of the wire loop is first driven into the post,

the sharp end of the dog is tilted up so that it engages with the teeth on the lower side of the back jaw, and holds the wood block, or other work, fast between the jaws. By turning the



Champion Quick Action Vise.

the wire is then stretched and the roller placed in position below or above the strands, according as the land rolls. The wire spike is then driven through the roller into the post. The advantages claimed for the device are that any kind of barb or plain wire may be used for fencing in connection with it;

handle to the right to an upright position the cam near the end of the rod raises the further end of the dog, allowing the front jaw to be moved to suit any width of work to be held. The jaws are 9 inches in length, and open 12 inches. The vise weighs 35 pounds and is accompanied by four 3-inch screws for fastening it to a bench. The manufacturers state that the vise is adapted to the use of carpenters, cabinet makers, pattern makers and wood workers of all kinds, and that the price at which it is offered puts it within the reach of all.

Rival Steel Measuring Tape.

In the description given in our last issue of this article, which is manufactured by the Lufkin Rule Company, Saginaw, Mich., an erroneous impression may have been given in regard to the quality of the steel used in it. The company advise us that in the Reliable steel measuring tapes made by them a high quality of imported steel is used, and in the Rival steel measuring tapes an American steel of excellent quality, nearly if not quite as good as the imported, but costing less, is used.

Patent Automatic Double Headed Crimper.

We present in the accompanying cut an illustration of the new patent automatic double headed crimper manufactured by George A. Crosby & Co. of Chicago, Ill., designed to crimp at the same time both ends on to the bodies of round cans. The crimping is entirely automatic, the cans being fed into the machine and crimped and discharged without handling, the machine having a capacity of 150,000 cans per day of ten hours. The cans with the heads snapped on loosely roll from the feeding trough or chute into the machine and are carried around between two sets of wheels, which set the heads down on the bodies as required and

to the water pressure. The sprinkler will do the same work as the Jewel, an illustrated description of which appeared in *The Iron Age* of January 11, 1894, except sprinkling in a half circle; the attachment by which this is accomplished being, it is explained, omitted from the Active.

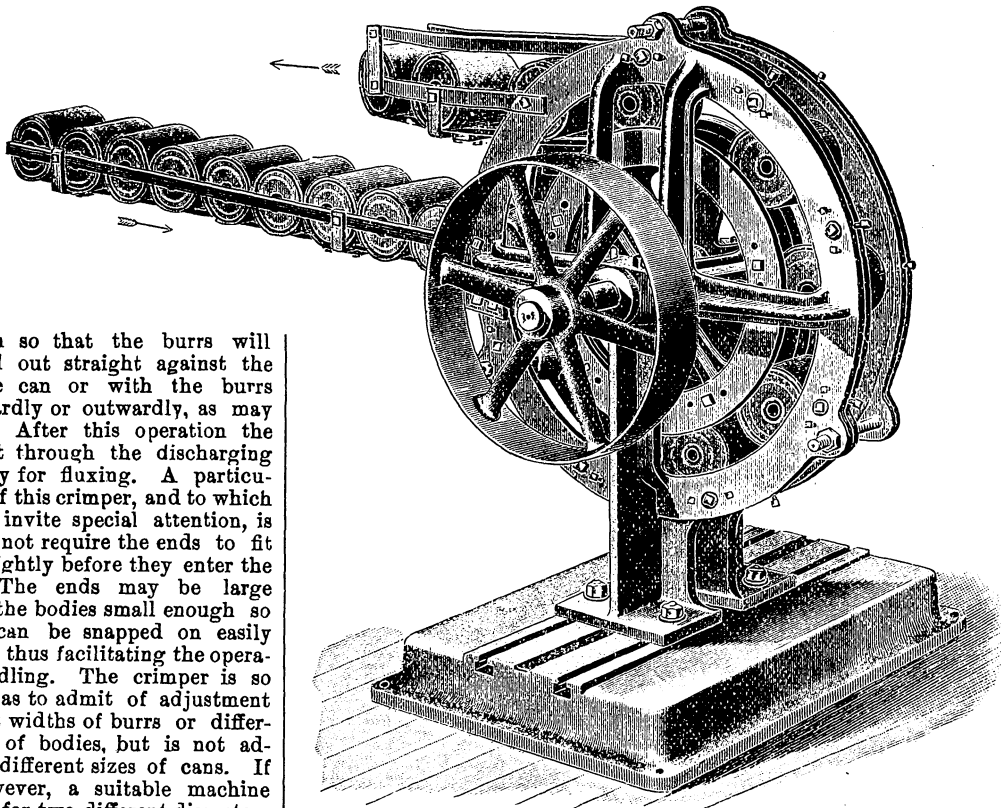
Venetian Iron Work.

A. J. Weed & Co., 106-108 Liberty street, New York, who recently commenced the introduction of Venetian iron work for home decorative purposes, as described in these columns in December 14 issue, are now furnishing coils of Venetian iron ribbon in continuous lengths of 50 feet. This material is specially adapted to this class of work and is intended for such as do not

using a hot sad iron does more or less scorch the fiber of the linen and turn it yellow, while linen ironed with a mangle has the appearance of always being new.

Improved Pencil Compass.

Keuffel & Esser Company, 127 Fulton street, New York, manufacturers and importers of drawing materials, &c., are making an improved pencil compass, suitable for designers, draftsmen and others. It is made in two sizes, the longest being $3\frac{1}{4}$ inches in length. There is a round spring clasp $1\frac{1}{4}$ inches long, to which is riveted a pointed and nicked steel arm of one piece of metal, slightly curved at the

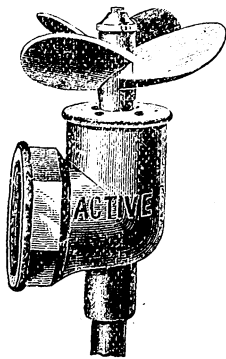


Patent Automatic Double Headed Crimper

crimp them so that the burrs will either stand out straight against the body of the can or with the burrs curved inwardly or outwardly, as may be desired. After this operation the cans roll out through the discharging trough ready for fluxing. A particular feature of this crimper, and to which the makers invite special attention, is that it does not require the ends to fit the bodies tightly before they enter the machine. The ends may be large enough or the bodies small enough so that they can be snapped on easily and loosely, thus facilitating the operation of handling. The crimper is so constructed as to admit of adjustment for different widths of burrs or different lengths of bodies, but is not adjustable for different sizes of cans. If desired, however, a suitable machine can be built for two different diameters of cans for placing on the same stand. The machine is so arranged that there is comparatively little friction caused by the cans rolling between the wheels, thus, it is said, making it almost indestructible.

The Active Lawn Sprinkler.

F. E. Kohler & Co., Canton, Ohio, are offering the lawn sprinkler here



The Active Lawn Sprinkler.

shown. The distributing channels of the sprinkler are referred to as being large, and it will sprinkle, it is stated, a diameter of from 2 to 40 feet, according

care for the drudgery of getting it out of the sheet for themselves. Another advantage is that the edges are slightly rounded, avoiding the objectionable burr usually left after shearing. The widths are $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$ and $\frac{7}{8}$ inch.

Mangles.

S. C. Johnson, Racine, Wis., is offering mangles in three different styles, designed to take the place of sad irons for doing up linen and bedding. The smaller machine weighs 100 pounds and is suitable for use in small families. The Eclipse machines have rollers either 24 or 27 inches long; the 24-inch weighs 200 pounds, and the 27-inch 225 pounds; the machines being adapted to general use. The third style, the Domestic, is made on the same plan as these made in England, weighing 350 pounds, being especially adapted to hotel use. The manufacturer remarks that where there is any considerable quantity of linen and bedding to be ironed the mangles are quite a necessity; where there is only a small quantity they are a luxury. The point is made that the common method of

end. A piece of blued steel with center slot is riveted to the lower part of the clasp and connects with the arm $2\frac{1}{4}$ inches from the point, it being held in any position by a milled head brass thumb screw. Attached to an ordinary lead pencil, so both points are together, it will sweep a circle when extended up to $8\frac{1}{4}$ inches, while if necessary, by placing the implement at the extreme end of pencil away from the point, it has a capacity of 13 inches. When not in use it can be carried in the pocket attached to the pencil without inconvenience or danger, and both are made to retail at 10 cents each.

Gleason's Ratchet Drill.

The Henry C. Ayer & Gleason Company, Philadelphia, are preparing to manufacture Gleason's ratchet drill upon a large scale, and to push its sale where it has not heretofore been introduced. The drill is made with two lengths of leverage, 14 and 18 inches, and is provided with a screw feed. The manufacturers guarantee the tool to give satisfaction as to design, workmanship, durability and price.

Current Hardware Prices.

MARCH 7, 1894.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

The character @ is used to indicate a range of price; thus discount 50&10@50&10&5 % signifies that the goods in question are sold at prices ranging from discount 50 and 10 % to discount 50 and 10 and 5 %.

Adjusters, Blind—

Domestic..... * doz \$3.00, 83% @ 33% & 10%
Excelsior..... * doz \$10.00..... 50&10&2%
North's..... list net @ 10%
Zimmerman's—See Fasteners Blind.

Ammunition—See Caps, Cartridges, Shells, &c.

Anvils—

American—
Eagle Anvil, * 10 lb..... 15&15&5%
Horse shoe brand, Wrought..... 11&11%
Moore & Barnes Mfg. Co..... 33%
Imported—
Armitage Mouse Hole..... 10% @ 11%
S. & H. machine finished..... 10% @ 11%
Trenton..... 10&10%
Wilkinson's..... 10% @ 11%
Peter Wright's..... 11&11%

Anvil Vise and Drill—
Allen Anvil and Vise \$3.00..... 40&10%
Cheney Anvil and Vise..... 25%
Millers Falls Co., \$18.00..... 20%
Star..... 45&5%

Apple Parers—See Parers
Apple, &c.

Augers and Bits—

Boring Machine Augers..... 70&70&10%
Car Bits, 12 in. twist..... 50%
Common Augers and Bits..... 70&70&10%
Cincinnati Bell-Hangers' Bits..... 80&10%
Forstner Pat. Auger Bits..... 15%
Jennings' Pattern Car Bits..... 40%
Jennings' Pattern Auger Bits..... 60%
C. B. Jennings & Co., No. 10, extension
hp..... 40%
C. B. Jennings & Co., No. 30..... 60%
C. B. Jennings & Co., Auger Bits, * set
32% quaters, No. 5, \$5; No. 30, \$3.50, 25%
Russell Jennings' Augers and Bits, 25&10%
Lewis' Patent Single twist..... 45%
L'Honmedieu Car Bits..... 15&10%
Pugh's Black..... 20%
Pugh's Jennings Pattern..... 30%
Snell's Bits..... 80&5%

Bit Stock Drills—

Cleveland..... 50&10&5%
Cincinnati, for wood..... 30&10%
Cincinnati, for metal..... 45&10%
Morse Twist Drills..... 50&10&5%
New Process Twist Drill Co..... 50&10&5%
Standard..... 50&10&5%
Syracuse, for metal..... 50&10%
Syracuse, for wood (wood list), 30&30&5%

Expansive Bits—

Clark's small, \$18; large, \$26..... 35&35&10%
Ives' No. 4, * doz \$80..... 40%
Steer's No. 1, \$20; No. 2, \$18..... 35&40%
Steer's No. 2, \$48..... 20%
Swan's..... 40%

Gimlet Bits—

Bee..... 25&25&5%
Common..... * gross \$2.75 @ \$3.25
Diamond..... * doz \$1.25..... 40&10%
Double Cut.....
Ct. Valley Mfg. Co..... 30&10%
Hartwell's..... * gro., \$10.00..... 40&10%
Douglass..... 40&10%
Ives..... 60&60&10%
Shepardson's..... 45&45&10%

Hollow Augers—

Bonney's Adjustable, * doz \$48..... 50%
Cincinnati Adjustable..... 25&10%
Cincinnati Standard..... 25&10%
Douglass..... 33% @ 33% & 10%
French, Swift & Co. (Beecher)..... 33% @ 33% & 10%
Ives'..... 33% @ 33% & 10%
Ives' Expansive, each \$4.50..... 50&5%
Stearns..... 20&10%
Universal Expansive, each \$4.50..... 20%
Wood's..... 25&25&10%

Ship Augers and Bits—

L'Honmedieu's..... 15&10&15&10&5%
Snell's..... 25&25&10%
Snell's Ship Auger Patt'n Car Bits..... 15&10&15&10&5%
Watrous'..... 25&25&10%

Awl Hafts—See Hafts, Awl.

Awls—

Brad. Handled..... * gr. \$2.50 @ \$3.00
Brad. Shouldered..... * gr. \$1.80 @ \$1.40
Peg, Pat..... * gr. 35¢ @ 35¢
Peg, Should..... * gr. \$1.50 @ \$1.55
Scratch, candied..... * gr. \$4.00 @ \$4.20
Scratch, Socket..... * doz. \$1.10 @ \$1.20

Awl and Tool Sets—See ts, Awl and Tool.

Axes—

First quality, best brands, \$7.00..... 7.50
First qual., other brands..... 6.00
Second quality..... 5.00
Axle Grease—See Grease,
Axle.

Axles—

No. 1..... 3% @ 4%
No. 2..... 3% @ 4%
No. 3..... 3% @ 4%
No. 4..... 3% @ 4%
No. 5..... 3% @ 4%
No. 6..... 3% @ 4%
No. 7..... 3% @ 4%
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No. 98..... 3% @ 4%
No. 99..... 3% @ 4%
No. 100..... 3% @ 4%

Bag Holders—See Holders, Bag.

Balances—

Sash—
Pullman..... 60%
Spring—
Spring Balances..... 40%
No. 2000 20 30
Chatillon, * doz..... \$0.80 0.95 1.75 net
Chatillon Straight Balances..... 40%
Chatillon Circular Balances..... 50&10%

Barb Wire—See Wire, Barb.

Bars—

Crow—
Cast Steel..... * doz 3%
Iron, Steel Points..... * doz 3%

Basins, Wash—

Standard Fiberglass, No. 1, 10% in., \$1.80;
12-inch, \$2.00; 18% inch, \$2.50; 16-inch,
\$3.00.

Beams, Scale—

Scale Beams, List Jan. 12, '82, 50&10%
Chatillon's No. 1..... 50&10&5%
Chatillon's No. 2..... 50%
Custer's..... 33%

Beaters—

Egg—
Bryant's..... * gross \$14.00
Double (H. & R. Mfg. Co.) * gro., No. 1,
\$12.00; No. 1, \$15.00; No. 2, \$36.00
Dover..... * doz \$1.00 @ \$1.2%
Dover (Standard Co.)..... * doz \$1.2%
Duplex (Standard Co.)..... * doz \$1.00
Duplex Extra Heavy (Standard Co.)..... * doz \$1.2%
Easy (H. & R. Mfg. Co.)..... * doz \$12.00
Improved Acme (H. & R. Mfg. Co.)..... * gro. \$9.00
Silver & Co..... * doz \$5.50
Spiral..... * gro \$4.25 @ \$4.50
Triple (H. & R. Mfg. Co.)..... * gro \$16.50

Culinary—

Keystone, P. D. & Co., Each, No. 1, \$1;
No. 2, \$2..... 20%

Bells—

Cow—
Common Wrought..... 60&10%
Kentucky Durham..... 70&10%
Kentucky, Sargent's list..... 70&10%
Kentucky, "Star"..... 20&10%
Texas Star..... 50&10&5%
Western, Sargent's list..... 70&10%

Door—

Crane, Brooks'..... 50&10&2%
Crane, Cone's..... 10%
Crane, Connel's..... 20&10%
Gong, Abbe's..... 33% @ 10%
Gong, Barton's..... 40&10&5%
Gong, Yaukee..... 45&10%
Lever, K. & E. Mfg. Co.'s..... 50&10&2%
Lever, Sargent's..... 60&10%
Lever, Taylor's Bronze or Plated..... net
Lever, Taylor's Japanned..... 25&10%
Pull, Brook's..... 50&10&2%

Electric—

Rigelow & Dowse..... 20%
Wollensak's..... 20%

Hand—

Extra Heavy Brass..... 70%
Light Brass..... 70&10&70&10&5%
Silver Chime..... 33% @ 10%
White..... 70%
Globe Cone's Patent..... 25&10&35%

Miscellaneous—

Call..... 45&50%
Farm Bells..... * doz 3% @ 3%
Steel Alloy Church and School Bells..... 40%

Bellows—

Blacksmith's..... 60&10&5% @ 60&10&10%
Hand Bellows..... 40&10&60%
Molders'..... 40&10&60%

Beltling, Rubber—

Common Standard..... 75&75&10%
Extra..... 60&10&60&10&10%
Standard..... 70&60&70&10%
N.Y.B. & P. Co., Carbon..... 60&60&5%
N.Y.B. & P. Co., Diamond..... 50&60&5%
N.Y.B. & P. Co., Para..... 40&40&5%

Bench Stops—See Stops, Bench

Benders and Upsetters, Tire—

Detroit Perfect Tire Bender..... 15%
Green River Tire Benders and Upsetters..... 20%
Stoddard's Lightning Tire Upsetters..... 15%

Bits—

Auger, Gimlet, Bit Stock Drills, &c.,
see Augers and Bits.

Bit Holders—See Holders.

Blind Adjusters—See Ad- justers, Blind.

Blind Fasteners—See Fasten- ers, Blind.

Blind Staples—See Staples, Blind.

Blocks—

Cleveland Block Co., Mal. Iron, 50&10&60%
Moore's Novelty, Mal. Iron..... 50%
Surr. Grip Steel Tackle Blocks..... 25%
See also Machines, Hoisting

Boils—

Carriage, Machine, &c.—

Com. list June 10, '84..... 80&10&80&10&5%
Genuine Eagle, Norway, list Oct. '84..... 80%
Eagle, Norway, list Oct. '84..... 80&10&80&10&5%
Phila. pattern, list Oct. 7, '84..... 80%
R.B. & W., old list..... 70%
Bolt Ends, list Jan. 1, 1890, 80&10&80&20%
Machine, list Jan. 1, 1890..... 80&10&80&20%

Door and Shutter—

Cast Iron Barrel, Square, &c..... 70&10%
Cast Iron Chain (Sargent's list)..... 65&10%
Cast Iron Shutter Bolts..... 70&10%
Ives' Patent Door Bolts..... 60&10&60&10&5%
Wrought Barrel..... 70&10&75%
Wrt B. K. Flush, Common..... 55&10%
Wrt Shutter, Brass Knob..... 50&50&5%
Wrt Shutter, Sargent's list..... 60&10%
Wrt Shutter, all Iron, Stanley's..... 60&10&60&10&5%

Wrought Square—

Wrt Sunk Flush, Sargent's list..... 60&10%
Wrt Sunk Flush, Stanley's list..... 50&10&5%

Stove and Plow—

Plow..... 60&10&5% @ 60&10&10%
Stove..... 60&10&60&10&10%
R. B. & W., Plow..... 55%

Tire—

Common, list Feb. 28, '83..... 85&65&10%
American Screw Company..... 75%
Eagle, Phila., list Oct. 16, '84..... 80%
Philadel., list Oct. 16, '84..... 80%
Bay State, list Feb. 28, '83..... 65%
Port Chester Bolt and Nut Company..... 65%
Empire list Feb. 28, '83..... 65%
Keystone, Philadel., list Oct. '84..... 75%
Norway Phila., list Oct. '84..... 75%
R. B. & W., Philadel., list Oct. 16, '84..... 80%

Borers, Tap—

Common and Ring..... 20&10%
Clark's..... 33% @ 35%
Enterprise Mfg. Co..... 33% @ 35%
Ives' Tap Borers..... 33% @ 35%

Boring Machines—See Ma- chines, Boring.

Bow Pins—See Pins, Bow.

Boxes, Wagon—

Spilker's Excelsior, 3 in. \$7.50, 4 in.
\$8.50, 5 in. \$13.00, 6 in. \$15.00..... 20%

Braces—

American Bit Brace and Tool Co..... 30&10%
Nos. 10, 12, 20..... 30&10%
Nos. 11, 21, 24, 27..... 70&10%
Nos. 22, 25, 28..... 60&10&5%
Nos. 29, 32, 37..... 70&10&5%

Amidon—

Barker's Imp. Plain..... 75&10&80%
Barker's Imp. Nickel..... 65&10&70%
Ratchet..... 75&10&80%
Eclipse Ratchet..... 60%
Globe Jawed..... 40&40&10%
Common Ball, American..... \$1.00 @ \$1.10
Universal, 8 in. \$2.10; 10 in. \$2.25
Buffalo Ball..... \$1.00 @ \$1.15
Barber's..... 60&10%
Bartholomew's..... 60&10%
Nos. 25, 27 and 30..... 50&10&80&5%
Nos. 117, 118, 119..... 70&70&5%
Common Ball, American..... \$1.00 @ \$1.10
Davis Patent..... 50&10%
Fray's Genuine Spofford's..... 50&50&10%
Fray's Nos. 70 to 120, 81 to 123, 207 to 414
60&10%
Ives' New Haven Novelty..... 70&70&5%
New Haven Ratchet..... 60&50&10%
Barber's..... 60&50&10%
Spofford..... 60&50&10%
P. S. & W. Co., Peck's Patent..... 60%
Rose & Johnson..... 50%
Saxton's..... 75&10&80%
Barker's Imp. Polished..... 75&10&80%
Barker's Imp. Nickel..... 65&10&70%
Ratchet, Polished..... 60&10&60%
Ratchet, Nickel..... 40&10&50%
Buffalo Ball..... net, \$1.10 @ \$1.15

Brackets—

Shelf, fancy..... 70&70&10%
Sargent's list..... 70&70&10%
Other makes at a wide range of prices.
Shelf, plain..... 85&70%
Regular, list..... 80&10&70&10%
Bradley Shelf Brackets..... 70&10%

Bright Wire Goods—See Wire.

Broers—

Hamself, 1 inch..... 9 10 9x11
Basting..... * doz. \$4.50 5.50 6.50
Morgan Odorless..... * doz. \$12.50
New Haven..... 50%
Queen City..... 33%
Wire Goods Co..... 65&10%

Buckets, Well—

Galvanized—
Helwig's Flat Iron Band..... \$3.75
Helwig's Wired Top..... * doz \$4.00
Hill's..... * doz. 12 qt. \$4.25; 14 qt. \$5.25
Iron Clad..... * doz. 14 qt. \$4.25 @ \$4.50

Bull Rings—See Rings, Bull.

Butcher's Cleavers—See Cleavers, Butchers.

Butts—

Brass—

Cast Brass, Fast..... 33% @ 10%
Cast Brass, Coarse Joint..... 33% @ 10%
Cast Brass, Tieouts..... 50%
Wrought Brass..... 80&50&10%

Cast Iron—

Fast Joint, Broad..... 50&10&60%
Fast Joint, Narrow..... 50&10&5%
Loose Joint..... 75&10%
Loose Joint, Japanned..... 75&10%
Loose Joint, Jap. with Acorns..... 75&10%
Loose Pin, Acorns..... 75&10%
Loose Pin, Acorns, Japanned..... 75&10%
Loose Pin, Acorns, Japanned, Plated Tips..... 75&10%
Mayer's Hinges..... 75&10%
Parliament Butts..... 75&10%

Wrought Steel—

Fast Joint, Broad..... 50&10&60%
Fast Joint, Narrow..... 50&10&5%
Fast Joint, Lt. Narrow..... 50&10&5%
Inside Blind, Light..... 50&10&5%
Inside Blind, Regular..... 50&10&5%
Loose Joint, Broad..... 50&10&60%
Loose Pin..... 50&10&60%
Table Butts, Back Flaps, &c..... 50&50&10%
Bronzed Wrought Butts..... 50&50&10%

Cages, Bird—

Henryx, Brass..... 10&50%
Henryx, Enameled..... 40&10&50%

Callipers—See Compasses

Calks Toe—

Burke's, One Prong, Blunt..... 5% @ 6%
Burke's, One Prong, Sharp..... 5% @ 6%
Burke's, Two Prong, Blunt..... 7% @ 8%
Gautier, One Prong, Blunt..... 5% @ 6%

Can Openers—See Openers, Can.

Cans, Milk—

S. S. & Co., 5-gal., \$3.00; 8-gal., \$4.40
10-gal., \$4.75 each..... 40&10%

Cans, Oil—

Galvanized Blue Band, 1 gal., * doz. \$2.35
Galvanized Blue Band, 5 gal., Tip-Top, * doz. \$12.00
Galvanized Blue Band, 5 gal., Faucet, * doz. \$8.00
Glass Oil, Friend..... * doz. \$2.75

Caps—

Percussion—
Hicks & Goldmark's and Union Metallic
Cartridge Co..... \$1.00
Eley's E. B..... 58&58%
Eley's D Waterproof, Central Fire \$1.00
E. B. Grnd. Edge, Cent. Fire, 1-10's..... 47&50%
E. B. Trimmed Edge, 1-10's..... 47&50%
F. L. Waterproof, 1-10's..... 35&37%
G. D..... 27&30%
Musket, Waterproof, 1-10's..... 50&5

Chalk Lines—See Lines.**Checks, Door—**

Unity 50%

Chisels—**Socket Framing and Firmer**

Ohio Tool Co. 75¢10¢75¢10¢10%

P. S. & W. 30%

Wetherby 30%

Buck Bros. 75¢75¢10%

Douglass 60¢10¢60¢10¢5%

Merrill 30¢30¢5%

L. & J. White. 30¢30¢5%

Tanged and Miscellaneous

Buck Bros. 30%

Charles Buck 30%

Butchers' \$4.70¢55.00 to 2

Spear & Jackson's \$5 to 2

Tanged Firmers 50¢60¢10%

Cold Chisels, fair quality, # 14 to 16

Chucks—

Beach Pat. each, \$8.00 20%

Danbury each, \$6.00, 30¢ to 25¢

Graham Patent 35¢

Morris's Adjustable, each, \$7.00, 20¢ to 25¢

Syracuse, Balz Pat. 25%

Sinker's Patent Chucks 25%

Combination Lathe Chucks 33½%

Drill Chucks 15%

Independent Lathe Chucks 40%

Universal Lathe Chucks 40%

Union Mfg. Co. 40%

Combination 40%

Independent 40%

Universal 40%

Victor \$8.50, 25%

Churns—

McDermald Star Barrel Churn, each

6 gal., \$2.60; 10 gal., \$2.75; 15 gal.,

\$3.00; 20 gal., \$3.25.

Tiffin Union, each, 6 gal. \$3.25; 7 gal.,

\$3.75; 10 gal., \$4.25.

Clamps

Adjustable, Cincinnati 15¢10%

Adjustable, Hammers 15¢10%

Adjustable, Stearns' 30¢30¢10%

Barnes' Machinists' Clamps 35¢

Cabinet, Sargent's 70¢10%

Carpenter's, Cincinnati 25¢10%

Carriage Makers', P. S. & W. Co. 40¢10%

Carriage Makers', Sargent's 75¢10%

Eberhard Mfg. Co. 40¢40¢10%

R. I. Tool Co.'s Wrought Iron 25%

Saw Clamps, see Vises, Saw Filers'.

Warner's 40¢10¢40¢10¢5%

Creasers, Butchers'

Beatty's 40¢40¢5%

Bradley's 25¢30%

Foster Bros. 30%

New Haven Edge Tool Co.'s 40%

Nichols Bros. 30%

P. S. & W. 35¢45¢33½¢10%

Schulte, Lohoff & Co. 40¢40¢5%

L. & J. White. 20¢5%

Clips

Baker Axle Clips 25%

Norway, Axle, # 5-16 55¢55¢

Norway Spring Bar Clips, 5-16 60¢55¢

2d grade Norway Axle # 5-16 65¢55¢

Steel Felloe Clips # 1, 1½

Superior Axle Clips 70%

Wrought Iron Felloe 70%

Cloth and Netting, Wire

—See Wire, &c.

Cockeyes**Cocks Brass—**

Hardware list (Globe, Kerosene, Lever

Bibbs, Racking, &c.) 60¢20¢60¢10

Coffee Mills—See Mills, Coffee**Collars Dog**

Brass, Pope & Stevens' list 40%

Chapman Mfg. Company, new list 40%

Embossed, Gilt, Pope & Stevens' list

30¢10%

Leather, Pope & Stevens' list 40%

Medford Fanny Goods Co. 40¢10¢50%

Combs Curry—

American Curry Comb Co. 35¢40%

Fitch's 50¢10¢50¢10¢10%

Gibbs' Magnetic # doz., \$2.00

Kohler's Humane # doz., \$1.75

Kohler's Magic Oscillating # doz., \$2.00

Rubber, per doz., \$10.00 25%

Compasses, Dividers &c.

Compasses, Calipers, Dividers, 70¢10¢75%

Bemis & Call Co.'s

Dividers 65%

Calipers, Patent Inside 65%

Calipers, Double 65%

Calipers, Inside or Outside 65%

Calipers, Wing 60%

Compasses 50¢55%

Excelsior 60%

Starrett's

Combination Dividers 25%

Wire Picture—

Braided or Twisted 80¢25¢80¢15%

Corkscrews—See Screws, Cork.**Corn Knives and Cutters**

—See Knives, Corn.

Crackers, Nut—

Acme. Japanned, # gro., \$30 50%

Nickel Plated, # gro., \$30 10%

Blake's Pattern, # doz., \$2.00 10%

Table (H. & B. Mfg. Co.) 40%

Turner & Seymour Mfg. Co. 50%

Cradles—

Grain 50¢20¢50¢5¢2%

Crayons—

White Crayons, # gross 70¢8%

D. M. Steward Mfg. Co.

Metal Workers', # gross, \$2.50 25%

Railroad, # gross, 2.00 25%

Rolling Mill, # gross, 2.50 25%

Soapstone Pencils, # gross, 1.50 25%

See also Chalk.

Creamery Pails—See Pails,**Crow Bars—See Bars, Crow.****Curry Combs—**

See Combs, Curry.

Curtain Pins—

See Pins, Curtain.

Cutters—**Meat—**

American 30%

Nos. 1 2 3 4 5

Each \$5 \$7 \$10 \$25 \$60 \$80

Enterprise 10 22 32

Nos. 10 12 22 32

Each \$3 \$2.50 \$3 \$5 \$15

Dixon's, # doz. 40¢10¢5%

Nos. 1 2 3 4

Each \$14.00 \$17.00 \$10.00 \$30.00

Draw Cut, each:

Nos. 5 6 8

Each \$50 \$75 \$80 \$225 20¢25%

Hale's, # doz. 11 12 13

Nos. 11 12 13

Each \$27.00 \$33.00 \$45.00

Home No. 1, # doz., \$26.00 55¢10%

Little Giant, # doz. 40¢10¢50%

Nos. 305 310 312 320 322

Each \$35.00 \$45.00 \$44.00 \$73.00 \$88.00

Miles' Challenge, # doz. 45¢45¢10%

Nos. 1 2 3

Each \$22.00 \$30.00 \$40.00

Triumph No. 505, # doz., \$21.00, 25¢30%

Woodruff's, # doz. 40¢40¢5%

Nos. 100 150

Each \$15.00 \$18.00

Chadborn's Smoked Beef Cutter, # doz.,

\$66.00

Enterprise Beef Shavers 20%

Slaw and Kraut—

Tucker & Dorsey Mfg. Co. 40%

Kraut Cutters, 1 knife, # gross, \$21.00

Slaw Cutters, 2 knife, # gross, 30.00

Tobacco

Acme # doz., \$20.00, 40%

All Iron # doz., \$4.25

Champion 20¢10¢90%

Nashua Lock Co.'s # doz., \$18.00, 60¢55%

National # doz., \$21.00, 30%

Wilson's # doz., \$24.00, 55¢10%

Washer—

Appleton's # doz., \$16.00, 60¢10%

Bonney's 30¢10%

Cincinnati 25¢10%

Johnson's # doz., \$11.00, 35¢

Penny's, # doz., Pol. S. Jap'd, 30%

Smith's Pat. # doz., \$12.00, 20¢10¢10%

Diggers, Post Hole, &c.—

Cronk's Post Bars, # doz., \$60.00,

60¢50¢50¢10%

Eureka Diggers, # doz., \$12.00, \$13.00

Fletcher Post Hole Augers, # doz., \$36.00,

20¢10%

Gem, Improved # doz., \$9.00, \$10.00, net

Gibbs' Columbia # doz., \$12.00

Gibbs' Hustler # doz., \$10.00

Gibbs' Imperial # doz., \$7.50

Gibbs' National # doz., \$12.00

Gibbs' Post Hole Digger # doz., \$12.75

Kohler's Hercules # doz., \$14.00

Kohler's Invincible # doz., \$12.00

Kohler's Little Giant # doz., \$18.00

Samson, # doz., \$34.00 25¢25¢10%

Schneider # doz., \$18.00

Shimer's Hollow Handle, # doz., \$24.00,

\$24.00

Vaughan's Post Hole Auger, # doz.,

\$8.50 to \$9.50

Dividers—See Compasses.**Dog Collars—See Collars, Dog.****Door Checks—**

See Checks, Door.

Door Springs—

See Springs, Door.

Drawers

Money, # doz. \$18 to \$20

Vadell's Improved, No. 1, # doz., \$15.00,

Vadell's Improved No. 2, # doz., \$18.00,

Vadell's Desk and Drawer, each, \$7.50,

Vadell's Desk and Show case, each, \$7.50

Drawing Knives—

See Knives, Drawing.

Drills and Drill Stocks—

Bench Drills, Stearns' 50%

Blacksmiths' Self-Feeding, each \$7.50, 20%

Automatic Boring Tools \$1.75 to \$1.85

Breast, Bartholomew's each \$2.50

Breast, Millers Falls each \$3.00, 25%

Breast, P. S. & W. 40¢10%

Chicago Automatic Drill 20¢10%

Goodell Automatic Drills 40¢55%

Ratchet, Curtis & Curtis 30%

Ratchet, Ingersoll's 25%

Ratchet, Merrill's 20¢20¢5%

Ratchet, Moore's Triple Action 20¢20¢5%

Ratchet, Parker's 20¢20¢5%

Ratchet, Weston's 20¢25%

Ratchet, Whitney's 20¢10%

Whitneys Hand Drill, Plain, \$11.00,

Adjustable, \$12.00 20¢10%

Twist Drills—

Cleveland 50¢10¢10%

Diamond, V. & B. 50¢10¢10%

Graham's Pat. Groove Shank, 50¢10¢10%

Morse 50¢10¢10%

New Process 50¢10¢10%

Standard 50¢10¢10%

Syracuse (Metal list) 50¢10%

Drill Bits or Bit Stock

Drills—See Augers and Bits.

Drill Chucks—See Chucks.**Dripping Pans—**

See Pans, Dripping.

Drivers, Screw—

Allard's Spiral, new list 25%

Brace Screw Drivers 25¢10%

Buck Bros. 30%

Buck Bros.' Screw Driver Bits 27½¢5%

Clark's Pat. 30¢35¢4%

Cincinnati 25¢10%

Douglass Mfg. Co. 20¢20¢10%

Ellrich's Socket and Ratchet, 25¢25¢10%

Fray's Hol. H. die Sets No. 3, \$12.00, 45%

Gay & Parsons 35%

Goodell's Automatic 50%

Knapp & Cowles

No. 1 60¢20¢70%

No. 2 60¢10¢10¢70¢5%

No. 3 60¢5¢60¢10%

Nos. 4 and 00, Acme and Ideal 50¢55%

Kolb's Common Sense, # doz., \$6.00,

25¢10%

Mayhew's Black Handle 60%

Mayhew's Monarch 45¢10%

P. S. & W. 70%

Sargent & Co.'s Blade 60¢10¢10%

Nos. 20, 40 and 60 60¢4¢10¢10%

Screw Driver Bits, Farr's, # gross, \$6.25

Screw Driver Bits, # doz., 60¢75¢

Stanley R. & L. Co.'s

No. 64, Varnished Handles 65¢10%

Stearns' 25¢10¢5%

Syracuse Screw Driver Bits 30¢30¢5%

C. T. Williamson Wire Novelty Co. 50%

Egg Beaters—See Beaters, Egg.**Egg Poachers—**

See Poachers, Egg.

Electric Bell Sets—

See Bells, Electric.

Emery—No. 4 to No. 54 to Flour, CF

46 gr. 150 gr. F.F.F.

Kegs, # doz. 45¢5 5 3 3

doz. 54¢ 5 3 3

10-lb cans, 10 5 3 3

in case, 6 0 5 5

10-lb cans, less

Halters—

Cover's Adj. Rope Halters.....	40¢25
Cover's Adj. Web Halters.....	35¢52
Cover's Hemp Horse and Cattle Ties.....	50¢10
Cover's Jute Cattle Ties.....	70¢25
Cover's Jute Horse Ties.....	70¢25
Cover's Rope, 7-16-in., Jute.....	70¢25
Cover's Rope, 1/2-in., Hemp.....	60¢25
Cover's Rope, Jute.....	60¢10
Cover's Saddlery Works Halters.....	30¢25
Cover's Saddlery Works Handy Web Halters.....	30¢25
Cover's Saddlery Works Horse and Cattle Ties.....	85¢45

Hammers—**Handled Hammers—**

Atha Tool Co.....	50¢10
Buffalo Hammer Co.....	50¢10
Humason & Beckley.....	50¢10
Verree.....	50¢10
Cheney's Claw.....	40¢10
Cheney's Claw & Riveting.....	60¢25
C. Hammond & Son.....	40¢10
Magnetic Tack, Nos. 1, 2, 3, 1.25, 1.50 & 1.75.....	30¢10
Maydole's, list Dec. 1, '85.....	25¢10
Nelson Tool Works.....	40¢10
Pick, Stow & Wilcox.....	35¢40
Fayette R. Plumb.....	40¢10
Artisan's Choice, A. E. Nall.....	50¢
Horseshoe Turning Hammers.....	50¢
Regular Y. & P. A. E. Nall.....	50¢
Other Hammers.....	50¢10
Sargent's.....	40¢10
Warner & Nobles, new list.....	25¢10

Heavy Hammers and Sledges—

3 lb and under.....	75¢15
3 to 5 lb.....	80¢
Over 5 lb.....	80¢
Wilkinson's Smiths.....	10¢11

Handcuffs and Leg Irons

See Police Goods.

Handles—**Cross-Cut Saw Handles—**

Atkins, new list.....	40¢
Champion.....	40¢
Ely's Perfection.....	40¢
Sensible.....	40¢

Iron, Wrought or Cast—

Bronze Iron Drop Latches.....	doz	70¢	ne
Chest and Lifting.....	70¢	70¢	10¢
Door or Thumb.....			
Nos.....	0	1	2 3 4
Per doz.....	\$0.90	1.00	1.08 1.35 1.50
			60¢10¢10¢
Jap'd Store Door Handles—Nuts, 1.62;			
Plate, 1.10; no plate, 0.88.....	doz	ne	
Roggin's Latches.....	doz	30¢	35¢

Plate.....33%&2%
Romer's Night Latches.....15%
R. & E. Mfg. Co., list mar. 20, 1893.....60%&10%
Sargent & Co., list.....60%&10%
Warner's Burglar Proof.....\$ doz. \$8.00, 50%
Yale.....net prices

Elevator.....33%&2%

Padlocks.....

Wrought Iron Padlocks.....

Brittan, Graham & Mathes, list Jan......75%
1894.....
Mallory, Wheeler Co., list January.....75%
1894.....
Norwich Lock Mfg. Co., list June.....50%&2%
1891.....
Russell & Erwin Mfg. Co., list June.....50%&2%
10, 1891.....
Sargent & Co., list January 1, 1891.....75%
William Wilcox Mfg. Co., list Janu-.....40%&2%
ary 1, 1891.....
Ames Sword Co., up to No. 150.....40%
Ames Sword Co., above No. 150.....50%
Barnes Mfg. Co......40%&10%
Champion Padlocks.....40%
A. E. Deltz.....40%
Eagle.....40%
Eureka, Eagle Lock Co......40%
E. T. Fraim's Keystone Scandinavian.....40%&2%
1010 line.....90%&40%
120 line.....90%&25%
109 line.....85%
510 line.....70%&10%
225, 610 and 200 lines.....50%&5%
All other numbers.....50%&5%
Horseshoe.....\$ doz \$9, 50%&50%
Hotchkiss.....30%
No. 3.....30%
Romer's Nos. 0 to 91.....30%
Romer's Scandinavian, &c., Nos. 100 to.....15%
505.....90%&50%
Scandinavian.....90%&50%
Slaymaker, Barry & Co......90%&50%
No. 1010 line.....90%&50%
No. 41 line.....80%
No. 61 line.....80%
No. 21 line.....80%
Star.....80%
Yale Lock Mfg. Co.'s.....net prices

Sash, &c......

Attwell Mfg. Co......25%&3%
Champion Safety list January 1893.....70%&5%
Clark's No. 1, \$10; No. 2, \$8 gr......33%&3%
Common Sense, Jap'd, Cop'd and.....\$ gr \$4.00
Br'zed.....
Common Sense, Nickel Plated.....

Corbin's Daisy, list Feb. 15, 1893.....\$ gr \$10.00
Davis Bronze, Bates Mfg. Co......60%
Ferguson's.....33%&3%
Fish (Liesche's pat.), No. 100, gr......\$ gr \$1.00
No. 105, gr......\$1.00
Giant, list Jan. 1892.....70%&5%
Hammond's Window Springs.....40%
Huginin's New Sash Locks.....25%&2%
Huginin's Sash Balances.....25%&2%
Ives' Patent.....60%&10%&50%&10%
Kempshall's Gravity.....60%
Kempshall's Model.....60%&10%
Monarch.....60%
Payson's Perfect.....60%&10%
Reading.....60%&10%&50%
Security.....70%
Universal.....30%
Victor.....60%&10%
Walker's.....10%
Wolcott's.....60%&10%&5%

Lumber Tools.....

See Tools, Lumber......

Lustro.....

Four-ounce bottles.....\$ doz, \$1.75; \$ gross \$17.00

Machines......

Boring.....

Without.....

Auxes, Upright, Angular......

Boss, Carpenters' 3.60.....

Boss, Ship Bldrs' 3.85.....

Douglas.....\$5.50 \$3.75.....50%
Jennings.....5.50 6.75.....50%&50%
Millers' Patent.....7.50.....25%
Phillip's Patent.....

with Auger.....7.00 7.50.....40%&10%
Snell's, Rice's Pat 5.50 6.75.....40%&10%&10%

Fluting.....

American, 5 in., \$3.00; 6 in., \$3.40; 7 in.,.....\$4.50 each.....35%
Combined Fluter and Sd Iron.....\$ doz \$15.00, 30%
Crown, 4 1/2 in., \$3.50; 5 in., \$4.00; 6 in.,.....\$5.00 each.....35%
Crown hand Fluter, Nos. 1, \$15.00; 2,.....\$12.50; 3, \$10.00; 4, \$8.25.....30%
Crown Jew, 6 in., \$18.50 each, 35%.....
Domestic Fluter.....each, \$1.50
Eagle, 4 1/2-inch Rolls, \$2.15.....35%
Eagle, 5 1/2-inch Rolls, \$2.85.....35%
Geneva Hand Fluter, White Metal.....

Knox, 4 1/2-inch Rolls.....\$ doz \$12, 25%
Knox, 6-inch Rolls.....\$ doz \$12, 35%
Shepard Hand Fluter, No. 86, per doz.....\$15.50.....40%
Shepard Hand Fluter No. 95, \$ doz.....\$3.00.....40%
Shepard Hand Fluter, No. 110, \$ doz.....\$11.00.....40%

Hoisting.....

Moore's Anti-Friction Differential Pul-.....30%
ley Block.....
Moore's Hand Hoist, with Lock Brake.....30%
Moore's Rope Differential Pulley.....30%
Block.....60%
Marris & Beekley (Teal Patent).....30%
See also Blocks......

Washing.....

Fair and Square.....\$ doz \$42.00
Anthony Wayne, \$ doz, No. 1, \$42; No......2, \$36; No. 3, \$42.
Wayne American.....\$ doz \$38.00
Wells.....\$ doz \$54.00
Western Star \$ doz, No. 2, \$36; No. 3.....\$39

Mallets.....

B. & L. Block Co., Hickory & L. V......30%&30%&10%
Fibre Head, Stearns.....33%&3%
Hickory.....20%&10%&20%&10%&10%
Lignumvitae.....20%&10%&20%&10%&10%

Mattocks.....Regular list.....60%&10%&50%&10%
Standard Fireware, No. 1, peck \$.....dozen, \$3.50; 1/4 peck, \$3.90

Measures.....

Standard Fireware, No. 1, peck \$.....dozen, \$3.50; 1/4 peck, \$3.90

Meat Cutters.....

See Cutters, Meat......

Menders, Harness.....\$2.00

Milk Cans.....See Cans, Milk.

Mills.....

Coffee.....

Box and Side, list, Jan. 1, 1888.....60%&60%
Net prices are often made which are.....
lower than above discount......
American, Enterprise Mfg. Co., list Jan......20%
17, 1893.....
National list, Jan. 1, 1894.....30%
Swift, Lane Bros......30%
Waddell's New Box Mills, Ideal.....60%
Brand, New List.....60%

Mining Knives.....

See Knives, Mining......

Molasses Gates.....

See Gates, Molasses......

Money Drawers.....

See Drawers, Money......

Mowers, Lawn.....

Out of Season......

Muzzles.....

Safety.....\$ doz, \$3.00, 25%

Nails.....

Cut and Wire. See Trade Report......

Wire Nails, Papered......

Association list, May 1, '92.....85%&5%
Tack Mfrs' list.....70%&50%&10%
Hungarian, Finishing, Upholsterers', &c......See Tacks.

Horse.....

Nos. 6 7 8 9 10.....

A. C......25% 23% 22% 21% 21%.....40%&10%
American.....9% 9% 9% 9% 9%.....net
Anchor.....23% 21% 20% 19% 18%.....35%
Ausable.....23% 23% 23% 23% 23%.....

Capwell.....10% 13% 17% 16% 19%.....10%&5%
C. B. K......23% 23% 23% 21% 21%.....40%
Champion.....25% 23% 22% 21% 20%.....10%&10%
Champlain.....23% 23% 23% 23% 23%.....40%&50%
Clinton, Fin......10% 17% 16% 15% 14%.....30%&5%
Empire Bronzed.....13%&14%.....40%
Essex.....23% 23% 23% 23% 23%.....

Northwest'n.....25% 23% 22% 21% 20%.....25%&50%
Putnam.....23% 21% 20% 19% 18%.....15%
Snowden.....9% 9% 9% 9% 9%.....net
Standard.....23% 21% 20% 19% 18%.....35%
Vulcan.....23% 21% 20% 19% 18%.....25%
Western.....23% 21% 20% 19% 18%.....50%

Picture.....

Brass Head, Combination list.....50%&10%
Brass Head, Sargent's list.....60%&10%
Porcelain Head, Combination list.....40%&10%
Porcelain Head, Sargent's list.....50%&10%
Niles' Patent.....40%

Nail Pullers.....See Pullers, Nail.

Nail Sets.....See Sets, Nail.

Nut Crackers.....

See Crackers, Nut......

Nuts.....List Dec. 18, 1889.

Square, Hex......

Cold Punched.....\$ doz. 5.00, 5.10 off list
Hot Pressed.....\$ doz. 5.80, 6.50 off list
In packages of 100 lb, add 1-10¢ lb, add.....
1¢ lb, net; in packages less than 100 lb, add.....
1¢ lb, net......

Oakum.....

Best or Government.....\$ m 6%&7%
Navy.....\$ m 5%&6%
U. S. Navy.....\$ m 5%&6%

Oil Tanks.....See Tanks, Oil.

Oilers.....

Brass and Copper.....50%&10%&50%&10%
Line and Tin.....55%&10%&70%&50%
Broughton's, brass.....50%
Broughton's Zinc.....60%
Malleable, Hammers' Improved, No. 1,.....\$3.50; No. 2, \$4.00; No. 3, \$4.40.....\$ doz.
Malleable, Hammers' Old Pattern, same.....10%&10%&5%
Olmead's Brass and Copper.....50%
Olmead's Tin and Zinc.....60%
Prior's Pat. or "Paragon" Brass.....50%
Prior's Pat. or "Paragon" Zinc.....60%&10%&10%
Steel, Draper & Williams.....50%
Wint & Hobbs Mfg. Co., Steel and.....Rust.....60%
Rust.....

Openers, Can.....

American.....\$ gross \$1.75 to \$2.00
Champion.....\$ doz \$2.00.....50%
Domestic.....\$ doz \$2.00.....45%
Duplex.....\$ doz 25¢, 15¢&20¢
Eureka.....\$ doz \$2.50, No. 2, \$2.50.....40%
Excelsior.....\$ doz \$2.25, 55¢&60¢
French, No. 4.....\$ doz \$2.25, 55¢&60¢
Iron Handle, No. 5.....\$ gr \$6.00, 45¢&60¢
Lyman's.....\$ doz \$3.75, 20%
Messenger's Comet.....\$ doz \$3.00, 25%
Moore's.....\$ doz \$3.00, 25%
Sardine Sissors.....\$ doz \$2.75 to \$3.00
Sprague, No. 1, 5¢; 2, 6¢; 3, 6¢; 4,.....\$ doz \$2.75
Star.....\$ doz \$2.75
Universal.....\$ doz \$3.00.....55%&5%
World's Best.....\$ gross, No. 1, \$12.00; No. 2, \$24.00; No. 3, \$36.00.....50%&10%

Packing, Steam.....

Rubber.....

Standard, fair quality.....70%&70%&10%
Inferior quality.....75%&80%
Extra.....60%&80%
Jenkins' Standard.....\$ doz \$8.00.....25%&25%
N. Y. B. & P. Co., Empire.....30%
N. Y. B. & P. Co., Salamander.....25%
N. Y. B. & P. Co., Standard.....50%
Miscellaneous.....

American Packing.....10¢ 11¢ 12¢
Cotton Packing.....15¢ 17¢ 19¢
Italian Packing.....13¢ 14¢ 15¢
ute.....7¢ 8¢ 9¢
Russia Packing.....14¢ 15¢ 16¢

Pails.....

Creamery.....

S. S. & Co., 18 qt., \$7.00; 20 qt., \$7.25.....\$ doz.
Galvanized.....

Quarts 10 12 14.....

Central Stamping Co......2.50 2.75 3.00
Fire Buckets.....2.75 3.25 3.50
Hill's Heavy Weight, \$ doz.....3.00 3.25 3.75
Hill's Light Weight, \$ doz.....3.00 3.25 3.75
Iron Clad.....2.50 2.75 3.00
Sidney Shepard & Co......2.50 2.75 3.00
Buckets.....See Well Buckets.

Indurated Fiber Ware.....

Fire Pails, deep.....\$ doz \$4.80
Fire Pails, round bottom.....\$ doz \$5.40
Milk.....\$ doz \$5.40
Stable, 14 qt......\$ doz \$8.00
Star Pails, 12 qt......\$ doz \$4.20

Standard Fiber Ware.....

Bugby Pails.....\$3.00
Chamber Pails, 14 qt......4.00 \$7.00
Dairy Pails, 14 qt., \$ doz.....3.75 4.25
Fire Pails, No. 1, 12 qt., \$ doz.....3.75 4.25
Fire Pails, No. 2, 14 qt., \$ doz.....4.00 4.25
Horse Pails.....4.00
Slop Jars (bal. trap).....7.50 8.50
Sugar Pails.....5.00 5.50
Water Pails, 12 qt., \$ doz.....3.15 3.75

Pans.....

Dripping.....

Large sizes.....\$ m 5¢
Small sizes.....\$ m 6¢
Silver & Co. (Covered).....40%

Fry.....

Standard List.....

No. 1.....1 2 3 4
\$ doz......\$3.00 \$3.75 \$4.25 \$4.75 \$5.25
No. 2.....\$6.00 \$7.00 \$8.00 \$9.00
Polished, regular goods.....75¢ to 75¢&10%
Acme Fry Pans.....60%&5%

Steel Edge, No. 1.....\$ doz \$1.75

Roasting and Baking.....

Columbian, S. S. & Co., Nos. 10, \$2; 20,.....\$2.25; 30, \$2.50 each.....60%&10%
Paper and Cloth.....

Sand and Emery.....

List April 19, 1893.....50%&10%&50%&10%
Sibley's Emery and Crocus Cloth.....30%

Parers.....

Apple.....

Advance.....\$ doz \$4.75
Baldwin.....\$ doz 5.25
Bonanza.....each 5.00
Daisy.....\$ doz 4.00
Dandy.....each 7.50
Eclipse.....\$ doz 4.00
Eureka, 1888.....each 18.00
Early Bay State.....\$ doz 5.50
Favorite.....\$ doz 5.00
Gold Medal.....\$ doz 4.00
Ideal.....\$ doz 4.00
Improved Bay State.....\$ doz 27.00 to \$30.00
Little Star.....\$ doz 4.50
Monarch.....\$ doz 13.50
New Lightning.....\$ doz 7.00
Oriele.....\$ doz 4.00
Penn.....\$ doz 3.00
Perfection.....\$ doz 4.00
Pomona.....\$ doz 4.00
Reading 78.....\$ doz 4.25
Reading 78.....\$ doz 4.00
Rocking Table.....\$ doz 6.00
Turn Table.....\$ doz 4.50
Victor.....\$ doz 13.50
Waverly.....\$ doz 4.00
White Mountain.....\$ doz 4.00

Potato.....

Antrim Combination.....\$ doz \$5.50
Hoosier.....\$ doz \$13.50
Saratoga.....\$ doz \$5.50
White Mountain.....\$ doz \$4.50

Pencils, Soapstone.....

See Crayons......

Pickers, Fruit.....

Prize Fruit Pickers.....50%

Picks.....

Railroad or Adze Eye, 5 to 6, \$12.00; 6.....to 7, \$13.00.....60%&10%&50%&10%&50%
Picture Nails.....

See Nails, Picture......

Pinking Irons.....

See Irons, Pinking......

Pins.....

Humason, Beckley & Co.'s.....60%&10%
Peck, Stow & W. Co......60%&10%&50%&10%
Sargent & Co.'s, \$17 and \$18.....60%&10%

Escutcheon.....

Brass.....60%&10%
Iron, list Nov. 11, 1885.....50%&10%&50%&10%
Pipe, Wrought Iron.....

List April 13, 1893......

1 1/2 and under, Plain.....57%&10%&10%
1 1/2 and under, Galv......60%&10%&10%
1 1/2 and over, Plain.....67%&10%&10%
1 1/2 and over, Galv......57%&10%&10%
Boiler Tubes, list Oct. 24, 1892.....55%&10%&10%
Casing, list Nov. 18, 1892.....62%&10%&10%
Cold Drawn Seamless Steel Tubing.....60%
Inserted Joints Casing, list Nov. 18,.....1892.....47%&5%
Steel Boiler Tubes.....27%&5%

Planes and Plane Irons.....

Wood Planes.....

Molding.....40%&10%&50%
Bench, First quality.....45%&10%&50%
Bench, Second quality.....50%

Pullers Nail-

Elipse, doz., \$24.00, 40%
 Economy, doz., \$24.00, 40%
 Giant, No. 1, doz., \$18.00, 10%
 Giant, No. 2, doz., \$18.00, 10%
 Pelican, doz., \$8.00, 25%
 Seranton, doz., \$18.00, 33%

Pulleys-

Brass Screw, 70%
 Hay Fork, "Anti-Friction," 5 in. solid, \$5.70 50%
 Hay Fork, "F" Common and Patent Bushed, 20%
 Hay Fork, Moore's Anti-Friction 5 in. Wheel, 40%
 Hay Fork, Reed's Self-Lubricating, 40%
 Hay Fork, Solid Eye, \$4.00; Swivel, \$4.50 50%
 Hay Fork, Stearns' Nos. 35 & 45, 60 & 100 20%
 Hay Fork, Stearns' Nos. 15, 25, 50, 60, 60, 60 20%
 Hay Fork, Tarbox Pat. Iron, 20%
 Hot House, A. W. & Co., 60%
 Japanned Screw, 60%
 Japanned Side, 60%
 Moore's Ceiling or End, Anti-Friction 40%
 Moore's Dumb Waiter, Anti-Friction 50%
 Moore's Electric Light, 35%
 Moore's Side, Anti-Friction, 50%
 Sash (Auger Mortise), 60%
 Common Sense, 60%
 Empire, 60%
 Acme, 60%
 Ideal, Nos. 2, 4, 10 & 15, doz net, 60%
 Star, 60%
 Ideal Nos. 25 and 55, doz, 22¢ net, 60%
 On bbl. lots extra 5%
 Shade Rack, 45%
 Shepard's Niagara, No. 25, doz 23¢ net
 Tackle Blocks-See Blocks.

Pumps-

Clster, Best Makers, 60%
 Pitcher Spout, Best Makers, 60%
 Pitcher Spout, Cheaper G'ds, 75%
 Myers' Pumps, low list, 50%

Punches-

Avery's Revolving, 40%
 Avery's Sawset and Punch-See Sawsets
 Bemis & Call Co.'s Cast Steel Drive, 50 & 55
 Bemis & Call Co.'s Check, 55%
 Bemis & Call Co.'s Spring, 50%
 Bemis & Call Co.'s Springfield Socket, 65%
 Niagara Hollow Punches, 20%
 Niagara Solid Punches, 55%
 Rice Hand Punches, 15%
 Saddle's or Drive, good, 60%
 Spring, good quality, 60%
 Spring, Leach's Pat, 15%
 Solid Timers, P. S. & W. Co., doz, 55%
 \$1.44 25%
 Timers' Hollow Punches, P. S. & W. Co., 20%

Rail-

Barn Door, Light, In. 1/2, 3/4, 1, 1 1/2, 2, 2 1/2, 3, 3 1/2, 4, 4 1/2, 5, 5 1/2, 6, 6 1/2, 7, 7 1/2, 8, 8 1/2, 9, 9 1/2, 10, 10 1/2, 11, 11 1/2, 12, 12 1/2, 13, 13 1/2, 14, 14 1/2, 15, 15 1/2, 16, 16 1/2, 17, 17 1/2, 18, 18 1/2, 19, 19 1/2, 20, 20 1/2, 21, 21 1/2, 22, 22 1/2, 23, 23 1/2, 24, 24 1/2, 25, 25 1/2, 26, 26 1/2, 27, 27 1/2, 28, 28 1/2, 29, 29 1/2, 30, 30 1/2, 31, 31 1/2, 32, 32 1/2, 33, 33 1/2, 34, 34 1/2, 35, 35 1/2, 36, 36 1/2, 37, 37 1/2, 38, 38 1/2, 39, 39 1/2, 40, 40 1/2, 41, 41 1/2, 42, 42 1/2, 43, 43 1/2, 44, 44 1/2, 45, 45 1/2, 46, 46 1/2, 47, 47 1/2, 48, 48 1/2, 49, 49 1/2, 50, 50 1/2, 51, 51 1/2, 52, 52 1/2, 53, 53 1/2, 54, 54 1/2, 55, 55 1/2, 56, 56 1/2, 57, 57 1/2, 58, 58 1/2, 59, 59 1/2, 60, 60 1/2, 61, 61 1/2, 62, 62 1/2, 63, 63 1/2, 64, 64 1/2, 65, 65 1/2, 66, 66 1/2, 67, 67 1/2, 68, 68 1/2, 69, 69 1/2, 70, 70 1/2, 71, 71 1/2, 72, 72 1/2, 73, 73 1/2, 74, 74 1/2, 75, 75 1/2, 76, 76 1/2, 77, 77 1/2, 78, 78 1/2, 79, 79 1/2, 80, 80 1/2, 81, 81 1/2, 82, 82 1/2, 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Snaps Harness, &c.	
Anchor (I. & S. Mfg. Co.)	60
Fitch's (Bristol)	50
Hotchkiss	10
Andrews	50
Sargent's Guarded	70
German, new list	40
Covert	50
Covert, New Patent	60
Covert, New R. E.	60
Covered Spring	60
Covert's Saddlery Works' Triumph	30
John Frots Saddle	70
Kelley & Woolworth's Steel Harness	50
Snaths	
Scythe	50
Soldering Irons	
Spittoons, Cuspidors, &c.	
Standard Fiberglass	
Cuspidors, 8 1/2 inch, 5 doz., No. 5, 38	No. 6
Spittoons, Daisy, 8-inch, No. 1, 4; 10 and 11 inch, 36	
Spoke Shaves	
Spoke Trimmers	
Spoons and Forks	
Tinned Iron	
Basting, Cen. Stamp, Co.'s list	70
Solid Table and Tea, Cen. Stamp, Co.'s list	70
Buffalo, S. S. & Co.	30
Silver Plated	
4 months or cash 30 days	
Meriden Brit. Co., Rogers	40
Rogers & Hamilton	40
O. Rogers & Bros.	40
Rogers & Bros.	40
Reed & Barton	40
Wm. Rogers Mfg. Co.	40
Simpson, Hall, Miller & Co.	40
Holmes & Edwards Silver Co.	40
L. Boardman & Son	50
Miscellaneous	
Holmes & Edwards Silver Co.	50
No. 47 Mexican Silver	50
No. 50 Silver Metal	50
No. 24 German Silver	50
No. 50 Nickel Silver	50
No. 49 Nickel Silver	50
Wm. Rogers Mfg. Co.	50
Rogers' Silver Metal	50
18% Rogers' German Silver	50
22% Rogers' Nickel Silver	50
Rogers & Hamilton	50
Steel Goods	40
Climetar, Flatware	40
Climetar, Steel Goods	40
Crown Hamilton, Flatware and Cutlery	50
German Silver	50
Nickel Silver	50
Britannia	50
Boardman's Nickel Silver, list July 1, 1891	50
Boardman's Britannia spoons, case lots	50
Springs	
Door	
Torrey's Rod, 39 in.	50
Warner's No. 1, 5 doz.	150
Gem (Coll), list April 19, 1886	20
Star (Coll), list April 19, 1886	20
Victor (Coll)	60
Champion (Coll)	60
Cowell's, No. 1, 5 doz.	180
Rubber, complete, 5 doz.	450
Hercules	50
Phoenix	30
Carriage, Wagon, &c.	
Elusive Concord, Platform and Half	60
Roller Springs	25
Sprinklers, Lawn	
Gibbs Arc	50
Gibbs Hustler	50
Squares	
Steel and Iron	50
Nickel Plated	50
Try Square and T Bevels	50
Diston's Try Square and T Bevels	50
Winterbottom's Try and Miter	50
Starrett's Micrometer Caliper Squares	25
Avery's Flush Bevel Squares	40
Avery's Bevel Protractor	50
Squeezers	
Fodder	
Blair's "Climax"	50
Lemon	
Porcelain Lined, No. 1	50
Wood, No. 2	50
Wood, Common	50
Danap's Improved	50
Sammis	50
Jennings' Star	50
The Boss	50
Dean's, No. 1, 5 doz.	50
Little Giant	50
King	50
Hotchkiss Straight Flash	50
Miller & Co. Glass	50
Standard Fiber Ware	
See Ware, Standard Fiber	
Staples	
Barbed Blind, 1/4 in. and larger	50
Barbed Blind, 1/4 in.	50
Fence Staples, Galvanized	50
Fence Staples, Plain	50
Grand Crossing Tack Co.'s list	70
Steels Butchers	
C. & A. Hoffmann's	40
Nichols Bros.	40
Steele's	
Stocks and Dies	
Blacksmith's Goods	35
Butterfield's Goods	35
Lightning Screw Plate	25
Reece's New Screw Plates	25
Reversible Ratchet	30
Gardner	25
Green River	30
Steps Bench	
Morrill's, 5 doz., No. 1, 10.00; No. 2, 11.00	
Hotchkiss' 5 doz.	50
Weston's, No. 1, 10.00; No. 2, 11.00	

McGill's, 5 doz.	
Cincinnati	25
Terrill's Nos. 1 and 2, 5 doz.	30
Miller Falls	20
Stearns	20
Stone	
Stones, Grind-See Grindstones	
Scythe Stones	
Pike Mfg. Co., list April 1892	30
Cleveland Stone Co., list Nov. 1892	30
Oil Stones, &c.	
Pike Mfg. Co.	50
Hindostan No. 1, 5 doz.	50
Sand Stone	40
Turkey Oil Stone, 4 to 8	10
Turkey Slips	20
Lilly White Washita	80
Rosy Red Washita	80
Washita Stone, Extra	80
Washita Stone, No. 1	80
Lilly White Slips	80
Rosy Red Slips	80
Washita Slips, Extra	80
Washita Slips, No. 1	80
Arkansas Stone, No. 1, 5 to 8 in.	30
Arkansas Stone, No. 1 1/2 to 8 in.	30
Lake Superior	10
Lake Superior Slips	10
Steel Polish	
See Polish Stone	
Stretchers Carpet	
Cast Steel, Polished	20
Cast Iron, Steel Points	20
Socket	15
Bullard's	25
Strops, Razor	
Genuine Emerson	50
Torrey's	20
Badger's Belt and Com.	20
Lamont Combination	20
Jordan's Pat. Padded, list Nov. 1, 89	50
Electric Cutlery Co.	50
Campbell Cutlery Co.	50
Stuffer, Sausage	
Miles' Challenge, 5 doz.	50
Perry	50
Draw Cut No. 4, each 30.00	20
Enterprise Mfg. Co., list Jan 17, 93	20
Silver's	40
Sweepers, Carpet and Lawn	
Carpet	
Bissell No. 5	100
Bissell No. 8	100
Bissell, Grand	100
Standard	100
Domestic, No. 2	100
Grand Rapids	100
Crown Jewel, No. 1, 18.00; No. 2, 19.00; No. 3, 20.00	
Magie	100
Improved Parlor Queen	100
Jannaped	100
Excelsior	100
Garland	100
Parlor Queen	100
Housewife's Delight	100
Ladies' Friend No. 2	100
Advance	100
Our Leader	100
Triumph	100
Supreme	100
Easy, Jap'd, 5 doz.	220
Easy, Jap'd, 5 doz.	220
Acme	100
Imperial	100
Grand Republic	100
Jap'd, 5 doz.	300
Nickel, 330.00	
Banner	
Jap'd, 5 doz.	220
The Star	100
Reliable	100
Rapid Jap'd, 5 doz.	220
Our Own	100
Model	100
Goshen Sweeper Company, Grand Rapids, Mich., make the following remarks:	
5 dozen in 6 months	100
10 dozen in 6 months	100
Exception L.F., when 10 dozen price is 13.50, and 25 dozen 13.00	
Lawn	
Thompson Mfg. Co.	30
Swings	
Davies Lawn	
Tacks, Brads &c.	
List October 19, 1893. Old established straight weights. Short Weight goods are sold at lower prices.	
Carpet Tacks	
American, Blued	80
American, Tinned and Cop'd	80
Steel, Bright and Blued	80
Steel, Tinned and Cop'd	80
Swedes Iron, S. S., Blued	80
Swedes Iron, S. S., Tinned	80
American Iron Tacks, Domestic	50
American Iron Tacks, Foreign	50
Swedes Iron Tacks	50
S. S., Blued	50
S. S., Tinned	50
Lanc., Blued	50
Lanc., Tinned	50
Upholsterers' S. S.	50
Upholsterers' Lanc.	50
Gimp	50
S. S., Blued	50
S. S., Tinned	50
Lanc., Blued	50
Lanc., Tinned	50
Basket and Trimmers' Tacks	
Lanc.	40
Hungarian Nails	50
Common and Patent Brads	50
Leathered Tacks	50
Looking Glass Tacks, S. S.	15
Picture-Frame Points, S. S.	25
Lace Tacks, Blued	50
Lace Tacks, Tinned	50
Finishing Nails	50
Trunk and Clout Nails	50
Black	80
Tinned or Coppered	80
Basket Nails	50
Chair Nails	50
Box Nails	50
Tin Capped Nails	50

Miscellaneous	
Double Point	90
Wire Carpet Nails	50
Olav Handle Carpet	50
Parlane Blue	50
Bill Nye Box	50
Parlane Gilt Nails, cartoon	50
Plymouth Rock Carpet Tacks	20
Home Tacks, No. 50	12
(12 cartons), \$36.00; No. 100, 5 cartons, \$72.00	
Home Nails, No. 200, 5 case (12 cartons), \$30.00; No. 400, 5 case (12 cartons), \$60.00	
Upholsterers' Nails	50
Wire Brads and Nails	
See also Nails, Wire	
Tanks, Oil	
Emerald, S. S. & Co.	30
\$11 each	50
Gaps, Measuring	
American	40
Excelcor, Special list	20
Spring	40
Chesterman's, Regular list	20
Thermometers	
Tin Case	80
Thimble Skeins-See Skeins	
Ties, Bale-Steel	
Standard Wire, list	50
Tinners' Shears, &c.	
See Shears, Tinners' &c.	
Tinware	
Stamped, Jannaped and Piced, list Jan 20, 1897	70
Tire Benders, Upsetters, &c.-See Benders and Upsetters	
Tire	
Tobacco Cutters	
See Cutters, Tobacco	
Tools	
Coopers'	
Bradley's	20
Barton's	20
L. & J. White	20
Albertson Mfg. Co.	20
Beatty's	20
Sandusky Tool Co.	30
Shaves Cincinnati Tool Co.	20
Lumber	
Ring Peavies, "Blue Line"	20
Ring Peavies, Common	18
Steel Socket Peavies	20
Mall Iron Socket Peavies	18
Cant Hooks, "Blue Line"	16
Cant Hooks, Common Finish	14
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish	16
Common Finish	14
Cant Hooks, Clip Clasp, "Blue Line" Finish	14
Cant Hooks, Clip Clasp, Common Finish	12
Hand Spikes	8
Pike Poles, Pike & Hook	12
11.50; 14 ft., 12.50; 16 ft., 14.50; 18 ft., 17.50; 20 ft., 21.50	
Pike Poles, Pike only	12
10.00; 14 ft., 11.00; 16 ft., 13.00; 18 ft., 15.00; 20 ft., 17.00	
Pike Poles, not toned	12
8.00; 14 ft., 9.00; 16 ft., 10.00; 18 ft., 12.00; 20 ft., 14.00	
Setting Poles, 12 ft., 12 ft., 14.00; 14 ft., 15.00; 16 ft., 17.00	
Swamp Hooks	18
Saw	
Atkins', new list	40
Silmonds	35
Transom Lifters	
See Lifters, Transom	
Traps	
Game	
Newhouse	40
Oneda Pattern	70
Blake's Patent	10
Mouse and Rat	
Mouse Wood, Choker	90
Mouse, Round Wire	10
Mouse, Cage, Wire	10
Mouse, Catch-all	15
Mouse, Bonanza	10
Rat, Decoy	10
Ideal	10
Cyclone	10
Hotchkiss Metallic Mouse, 5-hole traps	80
Hotchkiss Iron Rat Killer	10
Hotchkiss New Rat Killer	10
Schuyler's Rat Killer	10
Dandy	10
Waddell's Go Bang	10
Harper, Champion or Paragon	10
Balloon, Globe or Acorn	10
5 doz.	150
5 doz.	150
Trilers	
Butter and Cheese	
Trimmers, Spoke	
Bonney's	10
Stearns	10
Ives', No. 1, 15.00; No. 2, 12.00	
Douglas	50
Cincinnati	20
Trowels	
Lothrop's Brick and Plastering	20
Reed's Brick and Plastering	15
Diston's Br'k and Plastering	25
Peace's Plastering	25
Clement & Maynard's	20
Rose's Brick	15
Brade's Brick	15
Worrall's Brick and Plastering	20
Garden	70
Cleaves' Angle Trowel	10
No. 2, 30; No. 3, 15	
Trucks Warehouse, &c.	
B. & L. Block Co.'s list	40
Thompson Mfg. Co.	40
Harner's Barrel Trucks	40
Dalby Stove Trucks, Improved pattern	40
5 doz.	180
Tubes Beller	
See Pipes	

Twine	
Flax Twine	
No. 9 1/2 and 1 1/2 Balls	25
No. 12 1/2 and 1 1/2 Balls	25
No. 18 1/2 and 1 1/2 Balls	25
No. 24 1/2 and 1 1/2 Balls	25
No. 36 1/2 and 1 1/2 Balls	25
No. 264 Mattress, 1/2 and 1 1/2 Balls	50
Chalk Line, Cotton, 1/2 Balls	25
Mason Line, Linen, 1/2 Balls	25
2-Ply Hemp, 1/2 and 1 1/2 Balls (Spring Twine)	15
3-Ply Hemp, 1 1/2 Balls	10
3-Ply Hemp, 1 1/2 Balls	15
Cotton Wrapping, 5 Balls to 1/2	15
2, 3, 4 and 5 Ply Jute, 1/2 Balls	10
Wool	15
Paper	15
Cotton Mops, 6, 9, 12 and 15 to doz.	15
Vises	
Solid Box	
Parallel	
Fisher & Norris Double Screw	15
Stephens	25
Parker's	25
Wilson's	50
Howard's	40
Bonney's	50
Millers' Falls	40
Trenton	40
Merrill's	40
Hollands	35
Sargent's	70
Backus and Union	40
Double Screw Leg	15
Prentiss	20
Simpson's Adjustable	20
Moore's	20
Massey Quick Action	20
Saw Filers	
Bonney's, Nos. 2 & 3, 15.00	40
Stearns' Common, Nos. 0, 1, 2 & 3	50
Stearns' Rubber Jaw, Nos. 10, 12, 33, 33	50
Hopkins	10
Reading	40
Wentworth	20
Economy, 5 doz., Nos. 110, 110.00, 120, 120.00	
50	
Miscellaneous	
Phoenix Vises	33
Phoenix Hand Vises	33
Cowell Hand Vises	10
Bauer's Pipe Vises	10
Cincinnati	25
Enterprise Pipe Vises	40
Massey Combination Pipe Vise	40
Wads-Price Per M.	
U.M.C. & W.R.A.-P. E., 11 up	68
U.M.C. & W.R.A.-P. E., 9 up	82
U.M.C. & W.R.A.-B. E., 8	96
U.M.C. & W.R.A.-B. E., 7	110</

Whips

American Whip Co.: Length.	4 1/2	5	5 1/2	6	6 1/2	7	7 1/2	8 ft
X. L. Whalebone Driving.....	\$18.00	20.00	22.00	24.00	27.00	30.00	33.00	36.00
Eureka, Two thirds Whalebone.....	15.00	16.50	18.00	20.00				
Bull Bone, Half-length Whale bone.....								
American Standard.....	8.00	8.50	9.50	10.50	12.00	13.50	15.00	16.50
True Grip, Raw Hide Center.....	6.00	6.00	6.50	7.00	7.50	8.00		
New Name, Stocked Java, Black and Wine Colors.....				6.00				
Americus, 93 Pen Whip.....				6.00				
Gents' Light Driving No. 111.....				6.00				
Gents' Light Driving No. 106.....				5.00				
Hand-made Stocked Java No. 103.....			3.75	4.00				
A large variety of cheaper grades.....								
Team Whips.....								
Toy Whips.....								
Hardware Assortment, 10/American, 75 Whips for \$50.00.								

Wire and Wire Goods—

Iron—

Market,

Br. & Ann., Nos. 0 to 18.....	75¢ to 10¢	75¢ to 10¢
Cop'd, Nos. 0 to 18, 75¢ to 5¢		
Galv., Nos. 0 to 18.....	70¢ to 70¢ to 10¢	
Tin'd, Tin'd Hat, Nos. 0 to 18.....	70¢ to 70¢ to 10¢	

Stone,

Br. and Ann'd.....	80%	Extra 10%
Nos. 16 to 18.....	80%	Extra 10%
Nos. 19 to 20.....	80%	Extra 10%
Nos. 21 to 22.....	80%	Extra 10%
Tinned Broom Wire, 18 to 21, W. B. d.....	40%	
Galvanized Fence.....	75¢ to 10¢	
Copper, Hat Jan. 18, 1884.....	40%	
Annealed Wire on Spools.....	60%	
Malin's Annealed & Tin'd on Spools.....	60%	
Malin's Brass and Cop. on Spools.....	50%	
Ossawan Mills, Annealed and Tinned on Spools.....	60%	

Ossawan Mills, Brass and Copper on Spools.....	50¢ to 10¢
Tate's Spooled, Tin'd & Annealed.....	60%
Tate's Spooled Cop. and Brass.....	50%
Cast Steel Wire.....	50%
Stubs Steel Wire.....	30.00 to 2.30
Steel Music Wire, 12 to 30, imported.....	60 to 70¢
Wire Clothes Line, see Lines.....	
Wire Picture Cord, see Cord.....	

Bright Wire Goods—

Standard Hat.....	85¢ to 10¢ to 90%
Wire Cloth and Netting.....	100 ft \$1.45 to \$1.50
Galvanized Wire Netting.....	80 to 80 to 10%

Wire Barb—

See Trade Report.

Wire Rope—See Ropes, Wire.

Wrenches—

American Adjustable.....	40%
Baxter's Adjustable "S".....	40 to 10 to 50%
Baxter's Diagonal.....	60%
Coe's Genuine.....	50 to 50 to 10%
Coe's "Mechanics".....	50 to 10 to 2%
Grand Standard, English.....	50 to 10 to 7%
Lamson & Sessions' Engineers.....	60 to 10%
Lamson & Sessions' Standard.....	70 to 10%
P. S. & W. Agricultural.....	
Girard Agricultural.....	
Lamson & Sessions' Agric'l.....	75 to 10 to 80%
W. & B. Diamond.....	

Bemis & Call's:

Pat. Combination Bright.....	40 to 5%
Pat. Combination Black.....	40 to 10%
Merrick's Pattern.....	40%
Biggs' Pattern.....	30 to 10%
Cylinder or Gas Pipe.....	45 to 5%
No. 3 Pipe.....	5%
Aiken's Pocket (Bright).....	36.00, 50 to 10%
The Favorite Pocket.....	\$1.00, 40%
Weber's Pat. Combination.....	2%
Boardman's.....	30%
Always Ready.....	25 to 5%
Alligator.....	50%
Donohue's Engineer.....	20 to 10%
Eagle.....	50 to 10%
Acme, Bright.....	50 to 2%
Acme, Nickel.....	40 to 2%
Hercules.....	70 to 70 to 5%
Walker's.....	55 to 3%
Diamond Steel.....	55 to 3%
Cincinnati Brace Wrenches.....	25 to 10%
Taft's Wire Wrench.....	55 to 10 to 3%

Wringers, Clothes—

Am. Wringer Co.'s list, July 1, 1883.....	2% cash
Colby Wringer Co.'s list, Sept. 1, '81.....	2% cash
Lovel Mfg. Co.'s list, July 1, 1882.....	2% cash
Peerless Mfg. Co.'s list, Feb. 1892.....	2% cash
National Wringer & Mfg. Co.'s list, June 1, 1892.....	2% cash

Wrought Goods—

Staples, Hooks, &c., list, March 17, 1892.....	85 to 10 to 85 to 15%
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Paints, Oils and Colors.—Wholesale Prices.

Animal and Vegetable Oils—

Linseed, City, raw, per gal.....	52	@	54
Linseed, City, boiled.....	55	@	57
Linseed, Western, raw.....	52	@	
Lard, City, Extra Winter.....	65	@	66
Lard, City Prime.....	65	@	
Lard, City, Extra No. 1.....		@	50
Lard, City, No. 1.....		@	45
Lard, Western, prime.....		@	70
Cotton-seed, Crude, prime.....		@	28
Cotton-seed, Crude, off grades.....	25	@	27
Cotton-seed, Summer Yellow, prime.....		@	33
Cotton-seed, Summer Yellow, off grades.....	31	@	32
Sperm, Crude.....	62 1/2	@	
Sperm, Natural Spring.....	63	@	65
Sperm, Bleached Spring.....	63	@	70
Sperm, Natural Winter.....	63	@	70
Sperm, Bleached Winter.....	73	@	75
Whale, Crude.....		@	
Whale, Natural Winter.....	44	@	45
Whale, Bleached Winter.....	47	@	48
Whale, Extra Bleached.....	49	@	50
Sea Elephant, Bleached.....		@	
Menhaden, Crude, Sound.....	32	@	
Menhaden, Crude, Southern.....		@	
Menhaden, Light Pressed.....	36	@	38
Menhaden, Bleached Winter.....	41	@	42
Menhaden, Extra Bleached.....	44	@	45
Tallow, City, prime.....		@	50
Tallow, Western, prime.....		@	48
Cocanut, Ceylon.....	6 1/2	@	6 1/2
Cod, Domestic.....	38	@	40
Cod, Foreign.....	42	@	45
Red Elaine.....	35	@	38
Red Saponified.....	4 1/2	@	5
Bank.....	38	@	
Strait.....	39	@	
Olive, Italian, bbls.....	63	@	62
Neatsfoot, prime.....	60	@	65
Palm, prime, Lagos.....	5 1/2	@	6

Mineral Oils—

Black, 29 gravity, 25 @ 30 cold test.....	7	@	7 1/2
Black, 29 gravity, 15 cold test.....	7 1/2	@	8
Black, 29 gravity, summer.....	6	@	6 1/2
Cylinder light, filtered.....	14	@	16

Cylinder, dark, filtered.....	10	@	13
Paraffine, 23 1/2 @ 24 gravity.....	11	@	12
Paraffine, 25 gravity.....	10	@	11
Paraffine, 28 gravity.....	7 1/2	@	8
Paraffine, red.....	9 1/2	@	10 1/2

Paints and Colors—

Barytes, Foreign, 10 ton.....	\$22.00	@	24.00
Barytes, Amer. floated.....	29.00	@	32.00
Barytes, Amer. No. 1.....	16.00	@	18.00
Barytes, Amer. No. 2.....	13.00	@	15.00
Barytes, Amer. No. 3.....	11.00	@	12.00
Blue, Celestial.....		@	8
Blue, Chinese.....	40	@	50
Blue, Prussian.....	25	@	40
Blue, Ultramarine.....	8	@	25
Brown, Spanish.....	1/2	@	1
Brown, Vandyke, Amer.....	3	@	3 1/2
Brown, Vandyke, English.....	6	@	8
Carmin, No. 40, in bulk.....	2.75	@	
Carmin, No. 40, in boxes or barrels.....	2.85	@	
Carmin, No. 40, in ounce bottles.....	3.75	@	
Chalk, in bulk.....	1.75	@	2.00
Chalk, in bbls, 100 lb.....	33	@	40
China Clay, English.....		@	18.00
Cobalt Oxide, prep'd.....	9.00	@	11.00
Cobalt Oxide, black.....		@	
lots 100 lb.....	1.90	@	
less 100 lb.....	1.96	@	
Green, Paris, in bulk.....	10	@	10 1/2
Green, Paris, 170 @ 175 lb.....	10 1/2	@	11
Kegs.....	12	@	17
Green, Chrome, ordinary.....	6	@	12
Green, Chrome, pure.....	22	@	28
Lead, Eng., B.B. white.....	7	@	8
Lead, Ann. White, dry or in oil.....		@	
Kegs, lots less than 500 lb.....	6 1/2	@	6 1/2
Kegs, lots 500 lb to 5 tons.....	5 1/2	@	6
Kegs, lots 5 tons to 12 tons.....	5 1/2	@	5 1/2
Kegs, lots 12 tons and over.....	5 1/2	@	5 1/2
Lead, White, in oil, 25 lb tin.....		@	1 1/2
Lead, White, in oil, 12 1/2 lb tin.....		@	1 1/2
Lead, White, in oil, 10 lb tin.....		@	1 1/2
Lead, White, in oil, 5 lb tin.....		@	1 1/2
Lead, Red, bbls.....	5 1/2	@	6 1/2
Litharge, Kegs.....	5 1/2	@	6 1/2
Litharge, bbls, and 1/2 bbls.....	5 1/2	@	6 1/2

TERMS, &c.—Lead and Litharge.—On lots of 500 lb or over, 60 days' time or 2 1/2 % discount for cash if paid within 15 days of date of invoice.

Ocher, Rochelle.....	1.35	@	1 1/2
Ocher, French Washed.....	1 1/2	@	2 1/2
Ocher, German Washed.....	1 1/2	@	3
Ocher, American.....	1 1/2	@	1 1/2
Orange Mineral, English.....	8 1/2	@	9
Orange Mineral, French.....	10	@	10 1/2
Orange Mineral, German.....	8 1/2	@	9
Orange Mineral, American.....	8 1/2	@	9 1/2
Paris White, English Cliff stone.....	1.00	@	1.15
Paris White, American.....	65	@	75
Red, Indian, English.....	5 1/2	@	7
Red, Indian, American.....	2	@	6 1/2
Red, Turkey.....	9	@	11
Red, Tuscan.....	9	@	14
Red, Venetian, American.....		@	
Red, Venetian, English.....	100 lb.....	@	1.10
Sienna, Italian, Burnt and Powder.....	4	@	5
Sienna, Ital., Burnt Lumps.....	1 1/2	@	3 1/2
Sienna, Ital., Raw, Powder.....	4 1/2	@	5 1/2
Sienna, Ital., Raw, Lumps.....	1 1/2	@	3 1/2
Sienna, American, Raw.....	1 1/2	@	1 1/2
Sienna, American, Burnt and Powdered.....	1 1/2	@	1 1/2
Talc, French.....	1 1/2	@	1 1/2
Talc, American.....	1 1/2	@	1 1/2
Terra Alba, Fr'ch, 100 lb.....	95	@	1.25
Terra Alba, English.....	70	@	80
Terra Alba, American No. 1.....	65	@	75
Terra Alba, American No. 2.....	45	@	50
Umber, Turkey, Burnt and Powdered.....	3 1/2	@	4
Umber, Turkey, Bnt. Lu.....	2 1/2	@	3
Umber, Turkey, Raw and Powdered.....	3 1/2	@	3 1/2
Umber, Turkey, Bnt. Amer.....	1 1/2	@	1 1/2
Umber, Turkey, R/W Amer.....	1 1/2	@	1 1/2
Yellow, Chrome.....	10	@	25
Vermillion, American Lead.....	11	@	12
Vermillion, Quicksilver, bulk.....	43	@	
Vermillion, Quicksilver, bags.....	44	@	
Vermillion, Quicksilver sm'r pks.....	52	@	
Vermillion, English Import.....	80	@	85
Vermillion, Imitation, Eng.....	8	@	30
Vermillion, Trieste.....	90	@	92 1/2
Vermillion, Chinese.....	82 1/2	@	95
Whiting Common, 100 lb.....	37 1/2	@	42 1/2
Whiting Gliders.....	45	@	55

Zinc, American, dry.....	3 1/2	@	4 1/2
Zinc, French, Red Seal.....	7 1/2	@	
Zinc, French, Green Seal.....	9	@	
Zinc, French, V. M. X.....		@	7
Zinc, Antwerp, Red Seal.....	7 1/2	@	
Zinc, Antwerp, Green Seal.....	7 1/2	@	
Zinc, German, V. M. Z.....	6 1/2	@	7 1/2
Zinc, V. M. in Poppy Oil, G. Seal, lots of 1 ton and over.....	10 1/2	@	11 1/2
lots less than one ton.....	11	@	11 1/2
Zinc, V. M. in Poppy Oil, Red Seal.....		@	
lots of 1 ton and over.....	10	@	10 1/2
lots of less than 1 ton.....	10 1/2	@	10 1/2
Discounts.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or assorted grades, 1%; 25 bbls, 2%; 50 bbls, 4%. No discount allowed on less than bbl. lots.			

Colors in Oil—

Black, Drop, Frankfurt.....	25	@	30
Black, Drop, English.....	12	@	15
Black, Drop, Domestic.....	7	@	10
Black, Lampblack, Best.....	20	@	35
Black, Lampblack, Common.....	7	@	13
Black, Ivory.....	3	@	15
Blue, Chinese.....	35	@	40
Blue, Prussian.....	20	@	45
Blue, Ultramarine.....	12	@	18
Brown, Vandyke.....	7	@	12
Green, Chrome.....	8	@	13
Green, Paris.....	16	@	18 1/2
Sienna, Raw.....	7	@	14
Sienna, Burnt.....	7	@	14
Umber, Raw.....	7	@	10
Umber, Burnt.....	7	@	10

Putty—

In barrels and 1/2 bbls.....	.013	@	.013
In tubs.....	.013	@	.013
In tin cans.....	.013	@	.024
In bladders.....	.013	@	.024

Spirits Turpentine—

In regular bbls.....		@	30 1/2
In machine bbls.....		@	31

Glue—

Low Grade.....	8	@	10
Cabinet.....	12	@	14
Medium White.....	13	@	15
Extra White.....	17	@	20
French.....	10	@	22
English.....	10	@	15
Irish.....	12	@	

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